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## REDUCTION IN PRICE OF GAS IN NEW YORK.

At last the natural and inevitable result of opposition has made itself manifest, and the war has commenced apparently in earnest, and the prospect to-day is that large consumers will be able to buy their gas at very low rates—rates in fact so low that they might satisfy almost any one. The first shot was fired by the Manhattan Company, followed promptly by the Mutual, after which the younger Municipal Company wheeled into line, and, finally the old New York brought up its forces, and the firing is general all along the line in the lower part of the city. Each company seems to be acting on its own account, although they all start at the same point, viz., $2 a thousand for all consumers of less than 10,000 feet per month. From this point the price is graded down; some by per centages, some at a fixed price per thousand for different consumptions. The Manhattan announce their intention of selling to consumers of 100,000 per month at $1.25. The other companies make their prices in such a way as to practically amount to the same thing. We give the different circulars in another column. The result of this would seem to be that the company having the greatest number of large consumers, in proportion to their total number, will be most affected in its receipts by this reduction. How far this "scale descending" will be extended before the thing is over, no man can predict. The company having the smallest capital, per thousand feet sold, has the advantage so long as the price is not put below actual cost of production.

Those making their gas most cheaply are also better off than the others. As to the question of quality it has practically but little to do with the question so far as the mass of the consumers are concerned. What they look at is the amount of the bill.

This is very clearly shown by the fact that one company, whose gas contains from 26 to 33 per cent. of carbonic oxide, has already obtained some six or seven thousand consumers and probably sends out four or five hundred millions feet per annum. This company naturally claim that it is the superiority of the light furnished that has obtained them the popular support; but the fact nevertheless remains that they have always sold their product at lower prices than the old companies who have adhered to the hard and fast rule of the same price to every one, and that was $2.50 per thousand. The various companies will of course do every thing they can to defend the character of their own gas, and get as many consumers as possible. This is only the beginning of the matter. The people rub their hands and say "go it," and while trade is dull, in this hot weather, the proprietors of large establishments can amuse themselves by going around "shopping for gas."

How the stockholders are to be benefited by all this is a problem containing several unknown quantities, and has not yet been solved. If we were to suggest a remedy, in a general way, for this epidemic, it would be to amalgamate all the companies into one—with a capital stock not exceeding $5 per thousand feet sold annually, by all put together, and then sell gas at such a price that, while it would secure a fair remuneration for the money invested, it would be low enough to prevent the starting of any other competing company. In order to do this the manufacture must be conducted on the strictest scientific principles, and the sale upon purely business principles. It certainly would be possible, with such an organization, to sell gas at such a price that the consumption would be very largely increased both for domestic and other uses, and competition defied.

The harmony and co-operation which has so long existed between the old New York and the Manhattan companies has been very seriously disturbed by the action of a majority of the board of the New York company, in purchasing the right to use the Tessie du Motay process, with the understanding that the Municipal company do not enter into competition with them in the district below Grand street. It is understood that this action was taken in spite of the non-concurrence of those members of the New York company's board who are most actively interested in the board of the Manhattan company. So radical a change as this, if they actually put the process in operation, must have had the guarantee of reasons satisfactory to those who brought it about. What effect the reduction in price which has since taken place may have, on calculations based on the old price, could be better determined if it were known exactly why the process was bought. Certainly $300,000, which is the sum said to have been paid by the New York company to the Municipal company, will be a very convenient little amount of pin money for the latter to have at the beginning of the war, as it is so much clear gain to start with. Whether the effect of reducing prices will make it more convenient for the New York company to pay that amount, and as much more, perhaps, should they erect works for using the process, is not quite so clear.

Thus the war begins, with "every fellow for himself"; and it is to be hoped that, after the amusement has been continued long enough to satisfy

all concerned, it will be terminated by an amalgamation that shall be honest and permanent, and that afterwards the manufacture and sale of gas in the city of New York will be conducted on a true business basis.

If this be the result, the fight will not have taken place in vain. The people will be benefited permanently, and the investor will have a sure reasonable return for his money. The prime cause of the fight is too many companies, and too much stock and bonds as a consequence. It would appear that a natural result ought to be a reduction of both. There certainly is no money to be made by selling anything without a profit; and if, as Mr. Franklin says in his circular, gas is being sold at less than it costs to produce it, while the consumer may rejoice the stockholder must suffer, and would it not be far better to pocket the first loss, and reduce the capital down at once to an amount sufficient for carrying on the business and put an end to a waste and throwing away of resources. This is a point worthy of consideration by all stockholders. London and Paris have both been through this same contest, and the result has been amalgamation and cheap gas.

## Decision in Favor of Indianapolis Gas Light Company.

SUPREME COURT.—MUNICIPAL CORPORATIONS—CONTRACTS.

7,857. The city of Indianapolis *vs.* the Indianapolis Gaslight and Coke Company. Marion S. C. Affirmed.

Biddle, *J.*—On the 22d day of July, 1876, the city of Indianapolis and the appellee entered into a contract whereby the latter agreed to furnish gas for the supply of street lamps and all other places where gas was required for the use of the city in her corporate capacity, in consideration of an agreed compensation; the contract was to be in full force and operation for the term of five years if the city so elected. In 1878 the city notified the company that unless it would accept a certain named compensation the city would discontinue the use of gas August 1st of that year. The question in the case is, was the contract of 1876 a binding contract on the 1st of August of that year.

The parties had the power to contract concerning the subject matter.

Municipal corporations, besides the power to contract, which is generally granted to them within certain limits, have legislative, or governmental powers, by which they make laws to govern themselves, and pass ordinances to govern others, as the citizens of a town or city within their geographical limits. This power to legislate within the authority delegated to them by law is distinct from the authority to contract, although exercised by the same corporation. They cannot by contract delegate or restrict their legislative power, nor can they merely by their legislative power make a contract. These two powers need not be confounded. The exercise of the legislative power requires the consent of no person except those who legislate, while it is impossible to make a contract without the consent of another or others. When, therefore, the city made the contract in question with the gas company, it made it in the exercise of its power to contract, and not in the exercise of its power to legislate; and having power to make a contract touching the subject-matter, it had the right to make it according to its own discretion, as to its prudence or good policy, within the limits of its franchise. Nor does the contract in the least restrict the legislative power of the city, except that, as the sanctity of the contract is shielded by the constitution of the United States, it cannot in the exercise of its legislative power impair its validity, for it would be a solecism to hold that a municipal corporation by an ordinance or resolution can impair the validity of a contract, when the State which created it, by its most solemn acts, have no such power.

The fact, as alleged in the complaint, that the Legislature has reduced the ratio of taxation, and thus embarrassed the city in its finances, does not render the contract invalid, or in any manner excuse the city from the performance of its stipulations.

Where a municipal corporation makes a contract, not *ultra vires*, which is not against the public policy, and not fraudulent, it must be enforced the same as the contract of a business corporation or a person. The contract under consideration is not open to any of these objections. Judgment is affirmed.

## The Gas Analyst's Manual.

By F. W. HARTLEY.

This is the latest and best work on practical gas analysis. The name of the author, wherever he is known, is a sufficient guarantee of itself. Its aim is to furnish a practical hand-book that will be useful as a guide and assistant in the everyday operations in the photometer room and the gas laboratory. It is divided into three heads—photometry, impurities, and practical analysis, to which is added an appendix describing different burners and testing apparatus, with tables useful in the different computations. It should be in every gas library and laboratory, and will prove of much value to the profession. The price is $2.50; and it will be furnished, upon receipt of price, from this office.

DEATH OF A VENERABLE GAS MANAGER.—Mr. Burr Wakeman, for many years President of the Harlem Gas Light Company, of New York city, died last week, and was buried on Friday, the 11th inst. He had reached the advanced age of 84 years.

[From the London "Journal of Gas Lighting."]

## British Association of Gas Managers.

ANNUAL MEETING AT NEWCASTLE-UPON-TYNE.

The Sixteenth Annual General Meeting of the members of this Association was held Tuesday, June 10, at the Institution of the Philosophical Society, Newcastle-upon-Tyne—William J. Warner, Esq., C.E., of South Shields, the President, in the chair.

TUESDAY, JUNE 10.

The chair was taken at ten o'clock, and the proceedings were opened by the Mayor of Newcastle (Mr. T. Robinson), in the name of the inhabitants, welcoming the Association to the town.

The President thanked the Mayor for the reception accorded to the Asso ciation.

The minutes of the previous meeting, together with the statement of accounts, which had been printed and circulated among the members, were taken as read.

The Secretary (Mr. W. H. Bennett), on this and the following day, read the list of applications for membership, which were all acceded to.

The President then delivered the following

INAUGURAL ADDRESS.

Allow me to give expression to the feeling of deep obligation to you for the position which I have the honor to occupy. While believing that the position of President of the British Association of Gas Managers—the position which has been filled by men of such attainments as Hawksley and Barlow—is the highest in the gift of the profession of Murdoch, Clegg, and Malam, I am not insensible to the honor which the successors of Lebon confer upon the Presidents of this Association.

I acknowledge in your name the obligations, and reciprocate those fraternal sentiments which animated the Société Tecnique de l'Indurtrie du Gaz en France to the election of the Presidents of this Association to the position of honorary members. The reciprocation of honor now effected between that Society and this Association, I hope—and in expressing this hope I feel assured I am but expressing yours—may be followed by something better and more valued: the interchange of opinions, the reciprocation of papers, and the communication of facts affecting our common pursuits.

| | | |
|---|---|---|
| The total number of members as published in our last report is | | 666 |
| From this has to be deducted—By withdrawals | 4 | |
| By death | 6 | |
| | — | 10 |
| Leaving at the commencement of this session | | 656 |
| To this has now to be added— | | |
| Ordinary members | 31 | |
| Extra-ordinary members | 7 | |
| | — | 38 |
| Total | | 694 |

The continuous and constant accession of members must be as satisfactory to you as it is gratifying to your Committee. This reference to our muster-roll, as some of us too well know, is not an unalloyed pleasure; it has its dark side when it becomes a roll-call to which, on these occasions, your President has to answer. This duty appears to me to be more mournful than on any previous occasion. The one who has faithfully recorded every thought which has flashed through our assemblies will do so no more; one who has presided over us has gone to his rest; and others more or less distinguished, though not so well known, or occupying such prominent positions, have gone from us doubtlessly equally lamented by old professional friends.

The deceased members are Messrs. E. White, Birmingham; T. H. Bouttell, Sleaford; S. Johnson, London; H. Hathaway, Lower Sydenham; D. Hunter, Greenwich; J. Hegarty, Colombo. The non-members who have been closely and professionally associated with us, and who have died, are Messrs. Richard Laming, Aylesbury; T. Wills, London; W. G. Valentin, London. To these I might almost add the name of Mr. Le Neve Foster—a gentleman whom to know was to respect, and to whom our Association has been much indebted for many acts of courtesy and kindness in his capacity of Secretary of the Society of Arts and Sciences.

The *Journal of Gas Lighting* has so recently given obituary notices of the non-members whose names I have recorded, that I need not have further noticed them than to have expressed our regret that three such distinguished chemists should have passed from us almost together. But we cannot so pass over one of them—a young man, only 28, accomplished and gifted, who ministered so much to our pleasure and profit at the last meeting, that I feel it to be our duty, as I am assured it is your

wish, to give expression to our feeling of deep regret at the loss of one who gave such earnest promise of being of great service to our profession and Association. Can I say anything higher or better of the late Mr. Thomas Wills than has been already recorded: "He was a good son and a faithful friend?"

Mr. David Hunter, of Greenwich, was for many years the superintendent of that station of the Phœnix Company. He made a laudable attempt, many years since, to establish a benevolent institution. In a letter to me in 1870 he said: "Some years since I was anxious to bring the matter before the gas world, and cherished the thought that sooner or later it would be accomplished. Excuse me for not going into details, but, if all be well, I will be at the meeting, and I may then have an opportunity of explaining the object I have so long contemplated."

Mr. Hathaway was some years since manager of a works in this neighborhood—North Shields. He was a good practical manufacturing chemist, and at the time of his death was acting in that capacity.

The Gaslight and Coke Company lost the services of a most valuable and experienced officer by the death of Mr. Johnson, the able outdoor superintendent of the Company. Mr. Johnson passed through two most excellent schools—Liverpool and Leicester—to his high position at the Chartered. In the work of districting London he rendered valuable service to the Company which he so faithfully and honorably served.

Mr. Edward White, of Birmingham, presided at our Dublin meeting, and delivered a most excellent address. He was engineer to to the Birmingham gas company for some years, and his gentlemanly bearing and genial manners endeared him to all his friends. He was ever ready to impart information, to give of his large experience, and to throw open his works to those who were in need of such assistance. Thus he earned the position which he so well filled—a Vice-Presidentship of our Association.

It will be most in harmony with the life and character of the late Mr. King to only briefly refer to his labors in our profession—his life's work. For nearly a quarter of a century he labored in connection with the *Journal of Gas Lighting*. We are indebted to him for the faithful and satisfactory reports of our meetings, all of which, with the exception of the last, were written by himself; but we are still more indebted to him for a continuance of those favors of reporting and publishing, by which Mr. Barlow contributed so much to the success of this Association, which favors, I have great pleasure in informing you, are continued by Mr. Walter King. Nearly to the last, Mr. King's anxiety for our interests and the welfare of the *Journal* continued. Some time after our meeting, he wrote to me very despondingly. He said: "I have been a prisoner to the house, and almost entirely to my bed, for the last fortnight, and am still very weak. Sadly I begin to fancy my days of actual work are drawing to a close. I have had 35 years of very hard work, and am pretty well used up." His last words to me were the expression of a hope that this year of our Association might be a prosperous one. You all know what a retiring disposition his was; but his friends know the thoroughness of his character and his strong sympathies. Another tie is severed which connected the present with the past of gas lighting. To the bereaved, we can but give an assurance of our very sincere sympathy.

To return to the muster-roll. The growth of our Association has exceeded the expectation of all its friends, and has been a matter of congratulation for every President. You will pardon me referring to my letter in the *Journal of Gas-Lighting* for Aug. 25, 1863, which was the immediate cause of the formation of this Association; but it will let in a little light on the very earliest days of this movement, and will identify—which certainly will be gratifying to you all—our esteemed Secretary with the Association in embryo. The formation of this society previous to the publication of that letter was discussed several times very earnestly by the late Mr. Barlow, by Mr. Bennett, and myself; and though very sanguine hopes were entertained of its ultimate success, not one of us, I feel assured, had the remotest idea that in a few short years such a society would number nearly 700 members. You can measure this growth with that of another learned society. A few weeks since I read the report of the Annual Dinner of the Royal Institute of British Architects, and was surprised to find that though that society was founded upwards of forty years ago, it only numbers 750 members. This rapid growth of ours is indicative of great vitality. We are conscious, too, that our individual professional life has been raised by our higher associated life. The question, however, presents itself: Is our organization such as to conserve our energies, to raise to the highest the status of the individual, and to develop to the fullest our collective knowledge and experience?

For the purpose of such an inquiry, it is necessary to see what were the means for professional advancement of the gas engineer, and what was the position of the gas manager when this Association was founded, so as to ascertain what the objects of the founders were, what changes have since taken place, and what is our present position.

The year in which this Association was founded, strange to say, was the year of the jubilee of the first Gas Company that was established—the Chartered. That year, too, was the first in which the Company divided a 10 per cent. dividend. The Great Exhibition year brought forth the Polytechnic Exhibition of Gas Apparatus, under the auspices of the Gasfitters Association, through whose instrumentality some excellent lectures were given. A few years previous to this, a gathering of gas managers took place at the Adelaide Gallery, Charing Cross; but no attempt, I believe, was made to form them into an associated body, or to draw them at certain times together. This period, too, was one of great professional activity, and of considerable public agitation, the Great Central Gas Company having just been established. The highly-gifted Lewis Thompson (in whose native town, I believe, we are now assembled) was then laboring as few have done for the advancement of gas lighting, and was a constant contributor to the pages of the *Journal of Gas Lighting*. It was then, however, but a monthly publication, and another Exhibition—that of 1862—came, and found it but a bi-monthly, which it was at the time of the formation of this Association. The *Journal*, it may be said, was then our only means of communication, and "Clegg, on the Manufacture of Coal Gas" the only professional work.

Dr. Frankland, in a lecture delivered at the Royal Institution in 1863, referred to the relative positions of men of science and manufacturers; and his remarks may, I think, be taken as descriptive of ourselves as a body at this time. "The man of science," he says, "rejoices in the discovery of truth for its own sake. He gives his results freely to the world. It is no part of his duty, it is not his function to apply those truths to the utilities of life. Success in this direction requires quite different powers of mind. Those who possess these powers ought also to acquire the knowledge which would enable them to seize upon the discoveries of science and apply them to the wants of every day. This is the link which, up to the present day, has so sadly failed in the application of science to the manufacturing arts." The founders of this Association desired, it may be said, to relieve us from such reproaches as this. The object and aims are set forth in our Rules, in the words in which they were first published: "This Association shall devote itself to the encouragement and advancement of all matters connected with gas engineering, manufacture and finance; being established to facilitate the exchange of information and ideas among its members." The Chairman brought out one of these ideas more prominently in his speech than it appears in the Rules—the social character of the Association. He said the meeting was for the purpose of discussing the desirability of forming a society or association for the purpose of affording an opportunity of more direct social intercourse among managers, engineers, and others directly or indirectly interested in the construction and management of gas works; the result of such intercourse being the probable further development of all matters connected with the manufacture of gas; and in my letter four months previous to this, I wrote: "What appears to me to be wanted is a general meeting of gas men once a year, at which the leading subjects of interest to the gas trade might be discussed, not by set orations, but in a simple, businesslike manner; and that any new discovery or invention might have publicity given to it, and the advantage of being seen in operation. Two days would be ample time for this, as well as for the renewal of old professional friendships, and the formation of new ones. The society might meet in different cities or towns each year." I need not say that these objects have been most faithfully carried out, and the results looked for have been more than realized.

Now as to the changes that have taken place since these simple objects were set forth in such an unpretentious manner. The movement has extended to foreign countries, and every large centre of our own country has become a nucleus for the formation of local associations, and many of our members are connected with them. Further, we are becoming associated with foreign societies, besides having our ordinary members in every part of the world. Under such circumstances, our position cannot have remained unchanged, though we have faithfully adhered to our constitution. The local societies, whether they appreciably influence us or not, have a position in this country, and a hold upon the profession which we alone held. That there has been no rivalry must be admitted, and also that the membership of the local does not prejudice the individual in the British Association.

We cannot but hope that we shall always remain in the present so far satisfactory condition, whether our relative positions remain unchanged or not. Assuming that nothing can arise to disturb the mutual respect we have for the labors of each other, and the good feeling that exists, it but clears the way for the inquiry to be made, with which I started: Is our organization adapted to develop to the fullest the collective knowledge and experience of the profession, and make available for the common good the opportunities for observation which the members possess? If this is not so we do not take that high position as a profession which we should occupy, and fail, to this extent, in the application of science to the manufacturing arts.

That we do occupy such a position I think cannot be maintained, this,

however, is no reflection on the Association. By its action it was felt that its advantages required supplementing by local knowledge and local experience. Naturally, then, these local societies are the outgrowth of the other, and we have here, roughly shaped, perhaps, a model of an Association of fairer proportions, in which could be combined the general and the particular, theory and practice—facts from observation on which to base general laws, which would form a perfect whole—an Association that would elevate the profession to the position of which it is worthy.

The Scotch Associations, the North of England, Lancashire and Yorkshire, Midland, and West of England Associations, are all capable of having their several districts better defined than they are at present; indeed, the whole of the United Kingdom should be so divided, geologically, by the respective coal fields. Our learned and esteemed friend, Mr. James Paterson, of Warrington, gives five important coal districts to England—1, Newcastle and Durham; 2, Lancashire; 2, Yorkshire, Nottingham, and Derby; 4, South Stafiordshire; 5, South Wales. Our raw material would then naturally divide the work of observation and inquiry for the purposes of classification and comparison.

The British and local Associations—or, if you will permit me to call them so, the head and its branches—would find their work equally well defined. The head would determine the inquiry and formulary necessary, and the branches would make the observations and returns; the whole would then be classified and compared. No great discovery might be made in the course of such work, but it would yield facts and figures which would give us what we so much desire—reliable data. The three great branches of our manufacture—carbonization, condensation, and purification—processes effecting changes of the most subtle and complex character, if thus scientifically dealt with, would divulge nature's infallible laws to guide us in our work; and so every matter in connection with that work might be dealt with.

As a proof of the value of close and constant systematic observation in our manufacture, I refer you to "Paterson on Purification," of course without the least reference to the controverted questions. But how enlarged would be our powers of observation with every coal field pressed into our service, and every gas works a laboratory, with an ever-watchful observer recording day by day results for comparison and generalization. Official reports on new inventions and the working of patents of course would be eschewed, so that, without prejudice, without rivalry, without the least fear of such labors lessening the individual efforts to excel, this work could be pursued for the common good of a common calling.

In our report for 1873 will be found a paper by Mr. R. H. Jones, on "Gasholder Capacity compared with Consumption," that will give a very good idea of the nature of the work and the manner of doing it. By referring to that paper it will be seen how unobjectional such work may be, giving the individual the power to compare without being individually compared. In the report of the discussion on the paper it will be found that, excellent as it is, it just lacks the principle on which our returns as an associated institution would have been made—*locality*.

To become associated with the local societies it will be necessary to alter our constitution, but there will be no difficulty, I think, in this, as the matter will rest with ourselves. We are nearly all local members now. Such changes need not deprive the local or branch associations of freedom of action in other matters than those prescribed by or affecting the whole of those associated. The local presidents would doubtless be chairman of committees of the branches, and members of the councils of those associated for associated work. I need not pursue the matter further than this, to shadow forth the practical character of the changes suggested, and to show that by such we shall be brought more into harmony with the local associations. Such changes, I feel assured, are necessary to develop to the fullest our resources, and will rapidly and materially raise us as a profession.

A worthy member has directed the attention of the Committee to a change that is desirable to make in the reports of our transactions—namely, by printing them in larger type. A further change is also desirable; but that is a change in constitution, and one of real importance, if we are to exercise an educational influence upon the profession.

"The Education of the Future Gas Manager" would have been, at any previous period of our history, an important subject; now it is a momentous one. Men of science are agitating the world with discoveries and inventions that may most seriously affect our interests, and try to the uttermost the resources of our profession. It is a matter of regret that those with whom we have daily to do, and who are associated with us in our practical work, are generally excluded from the advantages of our higher professional associated life. From these classes, too, some of our best men have sprung. Still, as an Association, we deny them any advantage of what should be our higher training and larger experience, and refuse to help them to that higher position to which they aspire, and for which they are striving. A position is now the qualification for membership, and we cannot, unless we alter the qualification, exercise a general control over the election of candidates. Placed in the position of manager, he is eligible for election, whatever his experience or capacity may be. Now, if our constitution were changed so as to admit Associates, and if from this class were elected, after giving proof of qualification, the Members, their position would rest on personal attainments, not on fortuitous circumstances. We could then exercise an educational influence upon them; then membership could precede an appointment, and be of real value to a candidate. I have not referred to pupils, but to meet their case, if for no other reason, our constitution should include the class of Associates. This matter has already been well ventilated, and I trust that it will be dealt with in a formal manner at no distant date.

As I thus most earnestly impress upon you the necessity for the formation of a lower grade, so with equal earnestness do I recommend you to open the highest grade to our Ordinary Members—ordinary, I mean, by classification, but extra-ordinary by attainments. Not freely or unguardedly would I confer this honor, but give it only as a distinctive mark of the high appreciation in which any member might be held by the Association—to those only who distinguish themselves by great attainments, and who exercise their gifts in promoting the interests of our Association.

There have been no important changes in legislation affecting our interests during the past year. Companies do not appear to be losing confidence in the sliding scale. Four years since, the principle was adopted by the Commercial Company, and in the following year The Gaslight and Coke and the South Metropolitan Companies obtained powers for its adoption. "Precedents in Private Bill Legislation," by Mr. G. W. Stevenson—an exceedingly useful work to all, but almost invaluable to those about to go to Parliament, gives the following numbers for each year:

| Year. | Number of Gas Acts. | Number with sliding scale. |
|---|---|---|
| 1875 | 19 | 1 |
| 1876 | 31 | 2 |
| 1877 | 35 | 14 |
| 1878 | 34 | 11 |
| 1879 | 38 (Bills) | 9(?) |

There has been unfortunately a departure from the principles upon which the system is based—a standard price, and any departure from it, either for or against the consumer, to carry with it an advantage or a penalty. The standard price should be a fair average one, with a margin for fluctuations on both sides; not free from risk or liability, and open to advantages from low prices and improved work. The margin, however, should be the same on both sides of the standard; the penny up or down should carry with it the quarter per cent. So with the reserve and insurance funds there has been a departure from the principles laid down—that these funds are equivalents for advantages which companies possessed. For the Legislature to give us equivalents for advantages we possessed, and then for local bodies to interfere with such, is a course that cannot be justified. These principles certainly should either be accepted in their entirety or rejected.

There is one point, however, to which it is my duty to refer—the action of the Gas and Water Companies Association in presenting the petition for withdrawing clauses taking powers to light by electricity. There are 38 gas bills, I believe, in Parliament this session, 34 of which seek powers for electric lighting. The advisers of these Companies, I think, could not have done otherwise than insert the clauses at a time of such excitement and anxiety as prevailed when these Bills were prepared. That the responsibility of the position was felt, may be seen in the fact that nearly the whole of the bills contain the clauses. These companies, or at least those who are subscribers to the Association, should have been consulted, it is felt, before the petition was published. In this matter I am not expressing my own opinion only, but that of others. One other matter I have to refer to in connection with the Gas and Water Companies Association is the non-publication of reports. If this were done, and the Association made a truly representative one, its action would be effectively felt.

With the most friendly feeling I refer to these matters, and with a great desire to see the Association exercise that influence in the affairs of companies which I believe it is capable of doing. I say in the affairs of companies, because in other than direct legislation a vigilant watchful care should be exercised. The necessity of this could not have been better seen than at present. There are four Bills in Parliament relating to employers liability for injuries to their servants; also one on noxious gases—both subjects affecting us, though scarcely coming within our ordinary sphere of observation. The latter Bill is very important to us. It includes sulphate and muriate of ammonia works, tar distilleries, gas liquor works, and coke-ovens; but those ovens are excepted in which the coke made is a bye-product of the manufacture of gas. The works have to be registered and licensed, and unless "the owner of any work to which this part of this Act applies fails to use the best practicable means for the purposes for which he

is by this part of this Act required to use the same, he shall be deemed to be guilty of an offence against this Act, and shall be subject to a penalty not exceeding, in the case of the first offence, twenty pounds, and in the case of a second offence, fifty pounds, with a further sum of two pounds for every day during which such offence has continued, and, in the case of a third or any subsequent offence, twenty pounds for every day during which such offence has continued."

The electric light, as a system, has been compared with gas lighting. Well, if it ever becomes what some of its most enthusiastic manipulators believe of it—that, in simple language, wires may be laid through a house in such a manner that in any part of the system a suitable light may be evolved—then a fair comparison can be made, as to the advantage of the new light, perhaps. But that is not the system we now have fairly placed against ours. We run pipes through a building, and from any point in the system we *do* obtain light, of the smallest possible amount, or in quantity to rival the electric light; and we *do* obtain heat, of the most reliable and constant character, and of any temperature. Further, we *do* obtain power that may be used to drive machinery for works the most delicate, or may be made to store up power for the mighty forces of the hydraulic press. But to confine ourselves for a moment to the light only. What do we see? A small aperture, and nothing more, from which the gas issues, and evolves the light. Then place against this the most simple electric lamp, and what else have we but, for practical domestic purposes, a complex philosophical toy? In this matter I hope I shall not be misunderstood. I am speaking of things as fitted for everyday practical life, and so compare this light with our beautiful system.

Our esteemed Secretary has been practically engaged in the matter with one of our members—Mr. Valon, of Westgate-on-Sea. Their report was a very valuable contribution to the subject at a time when it was most required. Mr. Sugg has also been practically engaged on the subject, and I have no doubt will give us a most valuable paper. Indirectly, too, we have been greatly benefited by the inquiry that has taken place into this question, inasmuch as we have learned something on the law of opening ground, and the general powers of gas companies, in the evidence given by Mr. W. H. Michael, Q. C., before the Select Committee, on Lighting by Electricity.

Let us, however, look at the relative positions of each commercially, when introduced in competition with the other general modes of artificial lighting. We will take 1814, the year of the visit of the Allied Sovereigns. About this time the price of gas per 1000 feet, *estimated quantity*, was 15s. Assuming that it would be 13-candle gas, we may apply Mr. Lewis Thompson's tables, which give 54 3-7 lbs. of best dip candles as the equivalent of 1000 feet of gas—we will say 50 lbs. Now, the contract price for candles, per dozen lbs., to the Royal Hospital, Greenwich, in 1814, was 14s. 6d.; to this we may well add a halfpenny per pound for the higher price to the ordinary consumer, which will make the price 1s. 3d. per pound; or, light for light, assuming the candles to be equal to those experimented on by Mr. Lewis Thompson, the prices of the two would stand thus—Candles, 62s. 6d.; gas, 15 s. At the commencement, then, of gaslighting it was offered to the public at a reduction of 76 per cent. upon the cheapest mode of obtaining artificial light.

Compare this with the latest official report, that to the Metropolitan Board of Works, by Sir Joseph Bazalgette and Mr. Keates; and the facts are again given by Mr. Keates in his evidence before the Select Committee on Lighting by Electricity. In his evidence, he says: "It is of no use to deal with the question of naked lights, because palpably a naked light could never be used; but the light in an opal globe is equal to 155 candles, and in a frosted globe it is equal to 265 candles. To produce a light of 155 candles with gas, with one of the large Sugg burners, about 48 feet of gas would be consumed; and to produce a light of 266 candles, about 83 feet of gas would be consumed. The cost of the 48 feet of gas would be about 2d. per hour, and the cost of the 83 feet would be about 3½d. per hour. I have already stated that the cost of the electric light is 5.73d. per hour, and this is now a comparison between these lights, light for light. The cost of gas equivalent to the electric light in the opal globe is 2d., and the cost of gas equivalent to the electric light in the frosted globe is 3½d." In the joint report it is said: "At present there are defects connected with it (the electric light) that must prevent its adoption as a general mode of lighting competing with gas." This, I need scarcely remind you, is from practical experience, and it is the result of a competitive test, after years of experience and experiment, by some of the most gifted men of the scietific world.

I have compared the relative costs of gas and candles at the commencement of gas lighting; but what was the cost of the raw material—coal—at that time? In the London market, in 1814, the price, deducting 12s. 6d. duty per imperial chaldron (25½ cwt.), was 26s. 10d. per ton. In 1873, 59 years after, the price, deducting the duty of 1s. 1d. per ton, was 30s. 6d. per ton—14 per cent. higher than in 1814. But the price of gas had been reduced in London in 1873 to 4s.; or a reduction had been effected of 73 per cent. on the price alone, excluding the increased illuminating power.

*London Markets—Imports and Prices of Coal.*

| Duty Charged. | Year. | Total Imports. Chaldrons. | Price per Chaldr'n | Price per Ton.* |
|---|---|---|---|---|
| 8s | 1775 | 664,278 | ..... | ..... |
| 8s 10d | 1785 | 734,286 | ..... | ..... |
| 9s 3.3d | 1795 | 887,759 | ..... | ..... |
| " | 1805 | 971,270 | 44s 9d | 35s 1d |
| " | 1806 | 987,750 | 44s 5d | 34s 10d |
| " | 1807 | 933,148 | 45s 10d | 35s 11½d |
| " | 1808 | 1,085,050 | 49s 3d | 38s 7½d |
| 12s 6d | 1809 | 923,440 | 54s 6d | 42s 9d |
| " | 1810 | 1,120,237 | 51s 8d | 40s 6d |
| " | 1811 | 1,115,171 | 47s 8d | 37s 4½d |
| " | 1812 | 1,071,361 | 44s 10d | 35s 2d |
| " | 1813 | 970,901 | 52s 5d | 41s 0d |
| " | 1814 | 1,140,168 | 46s 9d | 36s 9d |
| 9s 4d | 1815 | 1,117,034 | 41s 8d | 32s 8d |
| " | 1816 | 1,214,405 | 40s 4d | 31s 8d |
| " | 1817 | 1,137,891 | 39s 10d | 31s 3d |
| " | 1818 | 1,202,541 | 41s 10d | 32s 10d |
| " | 1819 | 1,179,544 | 42s 11d | 33s 8d |
| " | 1820 | 1,313,736 | 43s 8d | 34s 3d |
| " | 1821 | 1,270,270 | 46s 3d | 36s 3d |
| " | 1822 | 1,254 031 | 41s 8d | 32s 8d |
| " | 1823 | 1,425,662 | 41s 0d | 32s 2d |
| 6s | 1824 | 1,505,021 | 37s 4d | 29s 3d |
| " | 1825 | 1,456,159 | 38s 6d | 30s 2d |
| " | 1826 | 1,600,227 | 37s 4d | 29s 3d |
| " | 1827 | 1,476,328 | 38s 6d | 30s 2d |
| " | 1828 | 1,537,691 | 38s 2d | 29s 11d |
| " | 1829 | 7,583,507 | 35s 1d | 27s 6d |
| " | 1830 | 1,630,800 | 36s 4d | 28s 6d |
| " | 1831 | 1,586,069 | 33s 6d | 26s 3d |
| City duty of 1s. 1d. per ton imposed by Act 1st & 2d Wm. IV., cap. 76. and subsequent acts. | | | | |
| | | Tons. | | |
| ..... | 1832 | 2,139,078 | ..... | 21s 11d |
| ..... | 1833 | 2,010,409 | ..... | 18s 3d |
| ..... | 1834 | 2,078,685 | ..... | 20s 6d |
| ..... | 1835 | 2,298,812 | ..... | 21s 11d |
| ..... | 1836 | 2,398,352 | ..... | 22s 11d |

| Year. | Total Imports. Tons. | Price per Ton. |
|---|---|---|
| 1837 | 2,626,997 | 24s |
| 1838 | 2 581,085 | 24s 6d |
| 1839 | 2,625,323 | 23s 8d |
| 1840 | 2,566,899 | 23s 7d |
| 1841 | 2,909.144 | 22s 4d |
| 1842 | 2,723,200 | 21s 2d |
| 1843 | 2,628,520 | 20s 2d |
| 1844 | 2,563,165 | 22s 10d |
| 1845 | 3,472,007 | 19s 2d |
| 1846 | 2,987,325 | 17s 11d |
| 1847 | 3,321,761 | 20s 10d |
| 1848 | 3,476,146 | 18s 2d |
| 1849 | 3,378,007 | 17s 8d |
| 1850 | 3,637,878 | 17s 1d |
| 1851 | 3,508,656 | 16s 1d |
| 1852 | 3,742,248 | 16s 6d |
| 1853 | 4,024,612 | 21s 2d |
| 1854 | 4,376,771 | 23s 9d |
| 1855 | 4,17.,954 | 21s 11 |
| 1856 | 4,391,584 | 18s 11d |
| 1857 | 4,366,530 | 18s 8d |
| 1858 | 4,477,191 | 18s 5d |
| 1859 | 4,567,303 | 18s 4d |
| 1860 | 5,070,515 | 20s 1d |
| 1861 | 5,227,721 | 19s 6d |
| 1862 | 4,967,349 | 17s 7d |
| 1863 | 5,119,887 | 18s 2d |
| 1864 | 5,468,045 | 20s 1d |
| 1865 | 5.903,271 | 20s 2d |
| 1866 | 6,013,265 | 20s 1d |
| 1867 | 6,322.033 | 20s 8d |
| 1868 | 5,970,090 | 18s 7d |
| 1869 | 6,227,084 | 16s 9d |
| 1870 | 6,769,007 | 17s 0d |
| 1871 | 7,227,430 | 17s 7d |
| 1872 | 7,556,423 | 23s 10d |
| 1873 | 7,824,288 | 31s 7d |
| 1874 | 7,423,488 | 24s 3d |
| 1875 | 8,204,892 | 22s 2d |
| 1876 | 8,451,376 | 19s 7d |
| 1877 | 8,591,683 | 17s 10d |
| 1878 | Not published yet. | |

* Calculated from Imperial chaldron of 25½ cwt.

*London (Market) Average Price of Coal and the Imperial Company's Gas.*

| Dates. | Duties Paid. | Coal Imports. | Price per Ton. | Gas per 1,000 Cubic Feet. |
|---|---|---|---|---|
| | Chaldr'n | Tons. | £ s. d. | |
| Three years ending 1807... | 9s 3.3d | 3,687,514 | 1 15 3 | ..... |
| Ten " " 1817... | 12s 6d | 13,891,964 | 1 16 9 | ..... |
| Ten " " 1827... | 9s 4d | 17,446,487 | 1 12 1 | (1824) (1827) 16s 0d |
| Ten " " 1837... | 6s 0d | 21,633,368 | 1 4 2 | 11s 10.8d |
| Ten " " 1847... | 1s 1d pr. ton | 28,378,429 | 1 1 7 | 8s 1.2d |
| Ten " " 1857... | | 39,080,386 | 0 19 0 | 4s 10.2d |
| Ten " " 1867... | | 53,076,580 | 0 19 4 | 4s 4.5d |
| Ten " " 1877... | | 74,245,761 | 1 0 11 | 3s 10.3d |

I must, however, direct your attention to the fact that the year 1873 was an exceptional one, the prices were abnormal; on the other hand, it is but due to our manufacture to show that the average of the last decade was not in the London market 1s. per ton above the three previous equal periods of time. Or, to take another comparison, the ten years ending 1877, the latest period up to which mining statistics have been published, the average price in the same market was 20s. 11d. against 21s.—the average of the fifty years from 1827. The prices, with the quantities imported into the London market for the whole period of gaslighting, I have the pleasure of placing before you in decades back from 1877.

The price of gas for the same period cannot fail to be equally interesting as valuable to you for comparison. This I have the satisfaction of placing before you. The prices are those of the earliest and largest, but now amalgamated Company of London—the Imperial, with its three stations, at Fulham, King's Cross, and Hackney. It was incorporated in 1821, and in 1824 the price charged was 17s. per 1000 feet, and on its amalgamation with the Chartered the price was 3s. 9d. per 1000. The highest price charged by the Imperial was 2s. per 1000 above that ever charged by the Chartered, this being but 15s. in 1821, against 17s. of the Imperial.

These prices of the raw material—coal—and our staple—gas—when placed in juxtaposition, form a title deed on which we may rest our claim for a continuance of the privileges which we have won, and to which we may probably turn, when attacked with that malevolence which is engendered of ignorance and prejudice. The prices of the Imperial Company's gas may be taken as the London prices, and the coals of the London market from 1805. These prices have been checked, as far as means would permit, with the prices paid by the Imperial, and as far as compared, with the exception of the earliest years, which I have excluded, very nearly agree. The regular fall of the gas is remarkable when compared with the fluctuations and well-maintained averages of the coal. This subject is a very wide and important one, as it is to me a very interesting one; but I can scarcely enter into it much further. It may be that I have but just touched upon the subject; still it is sufficient to demonstrate that a regular and continuous reduction has been made in the price of gas, without any benefit from the lowering of the price of coal.

The question for us now to consider is whether this reduction can continue, and whether the average price of coal will remain constant. To the latter our friend Mr. Lebour may refer this evening; the former—whether the reduction will continue if the price of coal is not lowered—is a question from which we can scarcely escape at the present juncture. No one can fail to see the importance of the inquiry; for if we possess this power, we lessen materially the chances of competition.

To guide us, then, in forming a judgment upon this matter, we must inquire as to the cause of these reductions. Labor, we know, has retarded rather than accelerated reductions. The increase of wages has been a most serious matter, especially in districts such as those in which we are now gathered; nor has there been any reduction in staff or non-productive labor. The tendency here is to increase; closer inspection, more thorough supervision, and better organization, have added sensibly to the cost of management. But in this increased cost of management have we not the secret of our success? Our coals yield more per ton, we make more per mouthpiece, we lose considerably less in distribution, and economize products. We have, as an Association, assisted considerably in this work; and I have no doubt whatever that there is still room for improvement in the details of the great branches of our labor, even in the best regulated works. We cannot however look for such results as we have already obtained to be greatly increased in the future. We are limited, therefore, in this respect, in our power to reduce the price of gas by—may I call it better management.

Dr. Ure, in his "Philosophy of Manufacture," says: "Manufacture is a word which, in the vicissitude of language, has come to signify the reverse of its intrinsic meaning, for it now denotes every extensive product of art which is made by machine, with little or no aid of the human hands; so that the most perfect manufacture is that which dispenses with manual labor." In this direction it is, in my judgment, that we are to look for the power to continue those reductions which so effectively show themselves on the diagram—by introducing machinery for the labor which is so costly, and so often unreliable.

In this direction many gifted men have toiled, and with varying degrees of success. I say toiled, for those only who have labored at the work know how great the difficulties are, and how discouraging are the fruits of their labors. Still, success will be achieved, I feel assured, and machinery will do the whole work of carbonizing. However, I do not confine my remarks to the carbonizing; I allude to the other work connected with our establishments—to purifying, to the breaking of cannel, which, I may say in passing, I have heard is most effectively done by a machine of Mr. Hislop, of Hillhead; by the lifting of coal and coke and the filling of wagons, the latter of which, through the kindness, of Mr. D. Swallow, of Bradford, I saw most effectively done; and generally to the introduction of all labor-saving machines.

Constructionally, then, we must look for an increase in the cost price by an augmented capital, but this will be more than balanced by the lessened charge of dividend to be paid on new capital, arising from the premiums paid on sales by auction. I look, however, for a still further augmentation of capital by increased cost of grounds for extensions; by more substantial and a higher class of buildings, and by improved and better finished general plant, and a more carefully constructed and elaborate distributing plant. Works cannot be tolerated now that were constructed years since—without the least pretention to style, or even form or fitness for the purposes required; neither can pipes be laid without regard to their adaptability to disturbing causes, and their preservation from the deteriorating effect of the mixed nature of the soil in which they are placed. Nor can any part of the manufacture or supply be left to manual adjustment that can be automatically regulated. Further, there will be a more rapid growth of capital, which will have to be paid on by many companies coming under the more stringent regulations of the Gas Works Clauses Act, 1871, on account of services and meters, which previously may have been carried to revenue.

Revenue, however, will gain considerably by most of these matters, and perhaps those items which will gain the most will be wear and tear and renewals. These in all balance-sheets are heavy items, if the works be well maintained. In the designing of works these items should be well borne in mind. The structures should be such as to prevent as far as possible any deteriorating effects from the work done within them. For example, take roofs of retort and purifying houses. These should be of a composit character—iron, wood, and tiles—and all parts of the principals should be easily accessible for painting. So of the machinery; it should be of ample capacity and power for the work to be done, and the plant, as far as possible, should be capable of enlargement.

The maintenance of works in a thoroughly efficient condition is of primary importance to a well-regulated company. I fear, however, unless well guarded against, there may be a tendency to sacrifice the true interests of the undertaking in this respect to the more pleasing, but then the more questionable advantage of the higher dividends from a reduction in price, which is given by the sliding scale, where in force.

For a continuous reduction in the price of gas we must, however, look to an increasing daily consumption. This, without any alteration in the price of coal or labor, or mode of manufacture, will afford us the means of lowering the price, and will lessen our anxiety, by enabling us to keep a larger number of firemen on through the summer for the winter work. In this matter the consumer has a direct interest in increasing his consumption; the producer in giving him every facility for doing so. Apparatus for heating, cooking, and producing motive power should be lent on hire at such rates, or upon such terms, that the cost and maintenance may be just covered; the increased consumption should be the only thing desired.

The movement for the exhibitions of gas cooking and heating apparatus has rapidly extended through the country, and is doing good work. Carlisle, Stockton, Birmingham, Bradford, Halifax, Leeds, and other places have all had their exhibitions, which have been great successes. I feel we are greatly indebted to Mr. Robert Wallis, of Stocksfield, chairman of the South Shields Gas Company, and his co-directors, for the inauguration of this movement, which is destined to do such good work in furthering the object of an increased daily consumption. In looking at the subject from this point, simply as managers of commercial undertakings, we shall see nothing but the commercial element, nothing but price and profit. But, animated by better feelings, we shall see that our common calling can lessen the labors and cares of domestic life, can brighten the homes and truly minister to the comfort and happiness of the masses. Our business thus becomes a social question. To deal with this we must raise ourselves to our higer professional position, and then we shall become conscious of our wider responsibilities and deeper obligations—responsibilities extending to our Divine Master, and obligations to an advancing civilization.

### PREMIUMS FOR PAPERS.

The President announced that the following premiums had been awarded for papers read last year:

1. Mr. George Livesey, for his paper on "Capital and Revenue."
2. Mr. John Methven, for his paper on "A New Standard for Determining the Illuminating Power of Gas."
3. Mr. Charles Hunt, for his paper on "Preventable Waste."
4. Mr. Thomas Travers, for his paper entitled "Some of the Causes Tending to Retard the Application of Gas for Heating Purposes."

### SCRUTINEERS.

Messrs. C. Sellers (York) and D. Clark (Ashton-under-Lyne) were appointed scrutineers of the balloting papers for the election of the officers of the Association for the ensuing year.

At the evening meeting the chair was taken at half-past seven o'clock, when a lecture was delivered by G. A. Lebour, Esq., F,G.S., Professor of Geology in the University of Durhom College of Physical Science, Newcastle-upon-Tyne, on "Practical Notes on Coal and Coal Getting."

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## Wednesday, June 11.

The chair was taken at ten o'clock, and the reading of papers was continued.

The Secretary stated that the report of the scrutineers showed that the following gentlemen had been appointed officers of the Association for the ensuing year:

*President.*—Mr. John Douglas.

*Vice-Presidents.*—Messrs. Charles Hunt, of Birmingham; George Wilson Stevenson, of London; and R. O. Paterson, of Cheltenham.

*Committee* (to replace those retiring by rotation).—Messrs. Thomas Newbigging, of Manchester; Robert Hunter, of Stalybridge; and Samuel Brothers Darwin, of Portsea.

*Treasurer.*—Mr. H. Newall.

*Secretary.*—Mr. W. H. Bennett.

*Finance Committee.*—Messrs. George Livesey, James Eldridge, and Corbet Woodall.

*Auditors.*—Messrs. Alfred Williams and Alfred Lass.

MEMBERS IN ARREAR.

The Secretary read the names of those whose subscriptions had been more than two years in arrear, and they were struck off the roll of members, with the exception of two, which, on the motion of the President, were, under Rule 37, ordered to be retained for another year.

ELECTION OF AN HONORARY MEMBER.

The President said there was a gentleman whom he thought it would be well to remove from the list of ordinary members, and put him on the list of honorary members—namely, Mr. George Livesey. He had very greatly contributed to the success of the Association, and he begged to propose that he be elected an honorary member.

This was unanimously agreed to.

QUALIFICATIONS FOR MEMBERSHIP.

In reference to the applications for membership, some of which, as previously stated, were submitted on this second day of the meeting—

Mr. Hunter (Salford) asked if two of the gentlemen on the list were qualified for membership.

The Secretary said he could not tell more than was stated on the proposal form.

Mr. Hunter said this quession had often been discussed, and he thought it very desirable that there should be some definite decision arrived at. He did not understand why he could not propose for membership some ten or twelve of his own assistants. He had always understood that, to be members, persons must be engineers, managers, or secretaries of gas works; but if it was understood that any assistants, who in large works might be numbered by the half-dozen, could become members, he perfectly agreed to it. All he said was that if assistant managers were to be elected, he should claim the same privilege for some of his assistants. One of the names he recognized as having been before the committe on more than one previous occasion.

The President thought Mr. Hunter would understand that it was very difficult indeed to draw a hard-and-fast line between one man and another. Surely a man in the position of outdoor superintendent over a large district was better qualified for the management of ordinary sized works, than a man who only had small works under his charge. It was very difficult to deal with this question, and he could not see how it could be settled in any other way than by adopting, as soon as possible, the suggestion he had thrown out on the previous morning, of forming a class of Associates; otherwise, they must exclude from their ranks many useful and valuable men, or else strain one of the rules to admit them. He did not think there was any difference between the gentlemen now proposed and some who had been elected on former occasions.

Mr. Eldridge (Richmond) said for two or three years he had proposed as a member a young man whom he considered far more eligible than some of those on the present list, but he had been refused. He was very glad that Mr. Hunter had raised the question.

Mr. Hunter said he quite agreed with what the President had said, and if all the gentlemen had the qualification named, he would not raise the slightest objection; but he did not think that was the case in one instance, at any rate.

The President said the Committee had had an assurance from his proposer that the gentleman referred to did fill an independent position, and that was the reason the Committee had put him forward as an approved candidate.

Mr. Hunter said if the qualification for membership was to be that a man was fit to take the position of manager, and he was to become a member before taking that position, he was quite willing to agree to it, as long as it was generally understood.

The President said that raised the question of a change in the constitution of the Association, which it would be impossible to discuss at that time. He thought the better way would be to exclude the three gentlemen to whom objection had been taken, and put the others to the vote.

Mr. Carr (Halifax) said the Committee had been placed in a most difficult position with regard to these names. They had gone very carefully into the matter, and submitted them to the meeting, although not feeling that they were on perfectly firm ground, but still being of the opinion that the balance of evidence was in favor of the course they had pursued. It would be a very anomalous thing, for example, to decline to receive the assistant engineer of the Beckton Gas Works, whilst they might have a man as member who was manager and secretary of a gas works, and did his own stoking, and who would be perfectly eligible according to the rules. The rules further stated that exception might be made at the discretion of the Committee, and the Committee felt, in passing these nominations, that if members had been elected who were assistants, as was the case, they had no justifiable ground for declining to receive the nomination of these gentlemen. The Committee were not prejudiced in any way, and personally he did not feel interested; but he believed the Committee had endeavored to do what was best for the Association.

After some further discussion, the whole of the gentlemen were elected *nem. con.*

PLACE OF MEETING NEXT YEAR.

The President said it was a principle with the Association to meet alternate years in London.

Mr. Longworth (Guilford) though there was no rule to that effect, and he would propose that they should go to Brighton, as they had been to London so many times.

The President said they might make their excursion to Brighton, which perhaps might meet Mr. Longworth's views.

It was then unanimously resolved to meet in London next year.

VOTE OF THANKS.

Mr. J. Paterson (Warrington) moved a vote of thanks to the President for the manner in which he had fulfilled the duties of the chairman. He said the members must all feel much indebted to Mr. Warner for the very able and excellent address he had delivered. He was most happy in bringing forward ideas based upon first principles, and that was what they should all aim at.

Mr. Travers (Cork) seconded the resolution.

Mr. Hunt said he had much pleasure in supporting the motion. He was sure they had all listened with infinite pleasure to the President's address, and he knew it would be read with renewed pleasure. In his address Mr. Warner had thrown out hints as to the future management of the Association which were invaluable, and he trusted that the subject would come before the members on a future occasion for decision.

The resolution was put by Mr. Paterson, and unanimously carried.

The President said that on such occasions one always had a difficulty in finding words to express one's feelings. He had tried to do what he could for the interests of those amongst whom his lot was cast, although not so successfully as he could wish. He felt his shortcomings, but yet, so far as light was given to him, he had endeavored to serve the Association, and to maintain the dignity of the Institution. He could only thank the members most heartily for the kind way in which they had supported him during his year in office. Every President must feel that he came into office inexperienced, and therefore had to rely to a great extent on the Permanent Secretary, Mr. Bennett. That gentleman had served the Association well, and the least they could do was to accord him a very hearty vote of thanks, which he begged to propose.

Mr. R. O. Patersou (Cheltenham) seconded the resolution, which he felt would be received most heartily. In Mr. Bennett they had a most energetic Secretary, whose earnest efforts were devoted at each annual meeting to promote the happiness and comfort of all.

The resolution having been carried by acclamation,

The Secretary thanked the members for the kind way in which the resolution had been received. Whatever capabilities he might have for promoting the success of the meetings, he felt quite incompetent to return thanks in an adequate manner for their kindness, or to express his appreciation of the eulogium which they had been pleased to pass upon him.

This being the whole of the general business, the meeting was brought to a close.

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DINNER.

In the evening the members, to the number of about 200, dined together at the Assembly Rooms, the chair being taken by the President, the vice-chairs by Messrs. R. O. Paterson, of Cheltenham, and Charles Hunt, of Birmingham. The toasts of "Success to the British Association of Gas Managers," "The Town and Trade of Newcastle," "The President-Elect," Mr. J. Douglas," "Past-Presidents of the Association," "The Committee,' and several others, were given, and a very pleasant evening was spent.

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THURSDAY, JTNE 12.

By invitation of the North of England District Association of Gas Managers, the Association visited Alnwick Castle, one of the seats of the Duke of Northumberland. Unfortunately, the weather was anything but propitious, and somewhat marred the enjoyment of viewing the splendid grounds and

surroundings of the castle. A dinner was afterwards served in the Corn Exchange, Alnwick, which afforded much gratification, the members generally being extremely pleased at the hospitality displayed towards them.

FRIDAY, JUNE 13.

Again by invitation of the North of England Association, the members went by steamer to visit the Elswick Engine and Ordnance Works of Sir W. G. Armstrong & Co., the hydraulic machinery of the Swing Bridge, and the Redheugh and Elswick works of the Newcastle and Gateshead Gas Company. The steamboat, carrying about 300 of the members and their friends, left the Tyne General Ferry Company's landing-stage at nine o'clock in the morning, and, after allowing time to visit the various works, arrived at Tynemouth a little before three o'clock in the afternoon. Here another magnificent banquet was served, at which Alderman Hedley, Chairman of the Newcastle and Gateshead Gas Company, presided; the vice-chairs being occupied by Mr. J. Hepworth, of Carlisle, and Mr. T. Trewhitt, of West Hartlepool. The toast of "The British Association of Gas Managers" was proposed by Mr. J. Hepworth, and responded to by Mr. W. J. Warner; while that of the "North of England Association of Gas Managers" was proposed by Mr. H. Woodall, of Leeds, and replied to by Mr. W. Ford, of Stockton-on-Tees, and Mr. W. Hardie, of Newcastle-upon-Tyne, the President and Secretary of the Association. Mr. Warner then proposed the health of the Chairman, and after several other toasts had been duly honored, the proceedings terminated.

So ended what may be truly looked upon as one of the most successful of the meetings of the Association out of London, and not a little of that success must be credited to the exertions made by the North of England Association, assisted by various local gentlemen, to afford a really splendid entertainment for the two concluding days of the Association meeting in Newcastle-upon-Tyne.

## The Eleventh Annual Convention of the American Society of Civil Engineers.

From a very full report of the meeting of the above Society published in the *Engineering News* of June 21 we condense the following:

The Eleventh Annual Convention of the American Society of Civil Engineers, was opened at 10 o'clock A. M., Tuesday, June 17, 1879, in the Council Chamber, Cleveland. The meeting was called to order by Secretary Bogart, on whose suggestion General Theodore Ellis, of Hartford, Conn., was called to the chair in the absence of President Roberts, who is now in Brazil. The Convention being called to order, the Mayor appeared, accompanied by Messrs. B. F. Morse, City Civil Engineer, and C. G. Force, Jr., Assistant City Engineer. The Mayor was met by Secretary Bogart and General Ellis, after which he delivered the address of welcome.

General Ellis responded briefly, returning thanks for the hospitality extended, and expressing the belief that the gathering would be very pleasant and profitable.

Mr. Charles Paine, General Superintendent of the Lake Shore & Michigan Southern Railway, was then introduced as President of the Convention. On taking the chair he said that there are in Cleveland sixty civil engineers; but they represent only a small proportion of the engineering talent of the place, as it is a city of mechanical as well as civil engineers, all of whom felt an enthusiasm at this meeting of distinguished engineers of America. The Local Committee had found it very difficult to divide the time of the convention in such a manner as to give a representation and sufficient display of the products and hospitalities of Cleveland engineers. Referring to the geological position occupied by this region of country, Mr. Paine stated that the Society in Cleveland was upon the subcarboniferous formation—the lower subcarboniferous. The Cuyahoga river once flowed two hundred feet below the present level of the valley; the site of Cleveland was at another period submerged, and the region has been peopled by amphibians—which accounts for the intelligence of the inhabitants of the present day. Hence the amphibian nature of the programme which had been arranged. While many would enjoy the trips on the water, he hoped there would be enough saurians to enjoy the excursions on land.

Mr. John Bogart was then elected Secretary, and Major GEORGE W. DRESSER, Assistant Secretary, by the convention.

After calling the roll of members, the chair appointed the following named gentlemen to determine the order in which papers should be presented: O. Chanute, Col. W. E. Merill, and John Kennedy.

The first paper read was upon "Engineering problems Involved in Deepening the Erie Canal," by Mr. E. W. Sweet, Jr., of Syracuse, New York.

It showed: First, that the limit of present economical enlargement is to deepen a foot by raising the banks.

Second, that the estimated cost of such deepening, derived from accurate surveys, is $1,146,000.

Third, that the increase of capacity of the present boats will be over fifty tons each.

Mr. Sweet gave an account of an extended series of experiments with horse and steam power to determine the precise resistance of boats loaded to different depths and moved at different velocities in channels of different depths and widths, with accompanying tables showing every element of each experiment. The mathematical investigation of the results of these experiments followed, by which is deduced the law of resistance encountered by vessels propelled in narrow channels. Then was given a mathematical determination of the effect of currents upon canal navigation, showing the amount of currents most beneficial to the navigation of the Erie Canal, by reason of the heavier traffic lying in one direction, and that such current, if employed in the deepened section, would shorten the down trip of loaded boats 50 hours and the round trip 25 hours.

It was shown, in conclusion, that the deepening of the canal one foot, with the use of the most beneficial current, would increase its efficiency and decrease the cost of its navigation fully two per cent., and produce annual direct benefits having a money value equal to the whole cost of making the improvement.

In the discussion which ensued, Mr Fisher called the attention of the Society to the statement in the New York *Tribune*, from one who signed himself an engineer, that, as it would cost $1,000,000 to deepen the canal one foot, and acquire the advantages, it would only cost $3,000,000 to deepen it three feet.

Mr. Theo. Allen desired to inquire whether the resistance decreased with increased speed by reason of the boat rising on the water and thus diminishing the skin friction.

Mr. Sweet replied that with the low speeds used this movement was not apparent, but that the resistance increased with the square of the velocity.

Prof. Wm. Watson asked whether experiments had been made to determine the action on the banks by boats propelled by steam, the boats being usually limited to abeut 5 kilos. per hour in France.

Mr. Bouscaren inquired whether length of boat entered into the formula for resistance, and was answered that a standard size of boat was used, and the whole wetted skin was taken account of.

The second paper, by Mr. Alfred Noble, engineer-in-charge of improvement at the Sault Ste. Marie, was upon "Cement and Appliances for Testing." The paper pointed out two causes of discrepancies in results obtained by different experimenters from the same mixture of cement, difference in manipulation and difference in forms of mold and clutches. It gave a description of the molds and clutches used in cement tests at Sault Ste. Marie, the manner of mixing mortar and molding briquettes, and the high results obtained. The average during the season was 500 lbs. per square inch, and some specimens exceeding 800 lbs. per square inch. The paper also noted defects of this apparatus, want of uniformity in results, experiments with briquettes of different forms, giving greater uniformity, but less tensile strength, and that the effect of applying a pressure of 32 lbs. per square inch during the settling of the briquette was to increase their strength 30 per cent.

The discussion on this paper was opened by Mr. Whittemore, Chief Engineer of the Milwaukee & St. Paul Railroad, who has made many thousands of tests of cement. He discards the use of rubber in the clamp, as its adherence to one side more than the other is likely to be a cause of the strain not being axial, thus giving a variation in results; he suggested the use of briquettes with spherical ends, and valued the test of parallelopipods under transverse force.

He was followed by Messrs. Collingwood, Wm. Sooy Smith, Cunningham Harlow, Norton, and Latimer. the latter moving that the convention recommend to the Society the appointing of a committee to fix rules for testing cements. A letter on the subject of German and other practice with cements, from Mr. Remicke, a German member of the Institute, was then read by the Secretary, after which the convention adjourned for dinner.

The Tuesday afternoon excursion, as given by the programme, was a decided success, and the visitors were given an excellent opportunity to see some of the most noted attractions of the city.

EVENING SESSION.

The convention was called to order at 8:20 o'clock by Mr. Charles Paine, Chairman, who expressed a regret that Mr. Fink, acting President, had not yet arrived. The Secretary read the report of the Committee on Order of Business. The proceedings of the evening consisted of professional papers.

Prof. Brush, on invitation, gave a brief lecture on the electric light, illustrated by means of the stereopticon.

"The Design and Construction of Egg-shapped Sewers" was the subject of a paper read by Mr. Cyrus G. Force, Jr., of Cleveland. He explained

their construction as followed out in Cleveland, giving their dimensions and explaining the formula with diagrams thrown upon the screen by means of the stereopticon.

Mr. Charles Latimer, of the Atlantic and Great Western Railway, presented "Remarks on Railroad Accounts," illustrating what he had to say by charts, which represented 14 years of the business of the Atlantic and Great Western Railway, taking into account the number of miles run, earnings, dead weight, rate per ton per mile, passenger rate, operating expenses, the capital of stocks and bonds, etc., by which the business of a certain year could be compared with others at a glance.

Mr. Charles McDonald, President of the Delaware Bridge Company, presented a paper on the "Ocean Pier at Coney Island." The length of the pier will be 1,000 feet, its width varying from 50 to 100 feet. The pier consists of a series of wrought iron piles sunk to an average depth of 18 or 20 feet, by means of a water jet, applied at the lower end, the pile being allowed to drop into position, and soon becomes firm. The first pile was sunk on the 22d of April, and occupied 10 minutes. On the 4th of June the last pile was sunk, making 280 in all, the longest of which is 57 feet 6 inches. The pier is rapidly approaching completion. When finished it will cost $250,000. Many views of the work in process of construction were thrown upon the screen.

Several members questioned Mr. McDonald at the close of the lecture on points in his remarks.

Gen. W. Sooy Smith came next, with the "Specifications of Glasgow steel bridge over Missouri River," which is of five spans, 314⅔ feet each, from centre to centre of piers, three above and two below grade; all steel; depth of truss, 36 feet, centre to centre of pins; height of through spans above the water, 50 feet. Total length of bridge (steel), 1,573⅓ feet; total length of bridge and approaches, 3,577⅓ feet.

A general discussion followed the reading of the paper, after which the convention adjourned.

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WEDNESDAY, June 18.

The first paper read was by Mr. Charler E. Emery, on the "Flexure and Transverse Resistance of Beams," which was discussed by Mr. Kent, of Pittsburgh. Mr. Collingwood read a paper on "The Progress of the East River Bridge."

On motion of Mr. Chanute the ten-minute rule for time allowed to each member was adopted.

Mr. Emery offered some remarks upon Mr. Searle's paper on "Relative Quantity of Material in Bridges of Different Kinds of Various Heights," published in Transactions, Vol. vii, p. 192.

The paper on the "Theoretical Resistance of Railway Curves," by S. Whinery, was discussed by Mr. Flagg in a paper prepared for the purpose, and by Mr. Searles.

Mr. Charler B. Brush, of Hoboken, N. J., read a paper on the "Construction and Maintenance of Roads," on which subject papers were also presented by several foreign members through the Secretary. These papers were remarks on the paper by Mr. E. P. North on the above subject of roads, already published in the Transactions.

The convention then adjourned for dinner.

EVENING SESSION.

A business session of the Society proper was held in the evening, General Theodore G. Ellis, of Hartford, in the Chair. On motion of Mr. F. Collingwood, the society went into secret session, and those not members were asked to step out for a few moments.

The session was devoted to the hearing of reports, amendments to the rules, and discussions on subjects of interest to the society only.

In accordance with a resolution adopted by the society at its meeting on May 7, the following suggestions were discussed:

1st. That provision be made for the holding, in addition to the annual convention, a number of general meetings in various cities in each year, for professional intercourse.

2. That papers be annually invited from members or other persons upon subjects of general ingineering interest, to be specified by the Board of Direction.

3d. That a system be established to award special regognition for the best papers contributed each year.

4th. That present members be encouraged to propose worthy persons for new members, associates, and fellows.

5th. That to promote the discussion of papers, advance copies be issued to such members or other persons as may be specially qualified to take part in the same, or to members applying for them in order to take part in the discussion.

6th. That members be encouraged to make use of the Society in New York for obtaining professional information.

7th. That the Library Committee be requested to report whether some plan may not be adopted to enable members living away from New York to consult the books of the library, under proper regulations to insure their return and to prevent injury.

8th. That suggestions be invited from members as to the feasibility of adopting some plan of affilation with local engineers' clubs in other cities.

9th. That the desirability be discussed of appointing Research Committees whose duties shall be to collect the results of existing experiments on any subject, and to suggest what further experiments are necessary, and also to collate such professional papers as may have been published elsewhere.

After a free discussion they were adopted, with the exception of the fourth and fifth suggestions.

The report of the Committee on Tests was freely discussed and its sentiments endorsed. The following is the report of the committee, as made through its chairman, Gen. W. Sooy Smith:

*To the American Society of Civil Engineers:—*

Your Committee on Tests of American Iron and Steel begs leave to submit the following report:

At the annual convention of the Society, held at the city of Chicago seven years ago, your Committee on Tests was created. By frequent reports and by papers read before the Society, you have been kept fully advised of the efforts made by the committee to procure from Congress the necessary appropriations for carrying out the work of the United States Testing Board. You have also been informed of the scheme of investigations devised by the Board, and the progress made in such investigations. Two appropriations have been obtained, amounting in the aggregate to $94,396.98, the odd dollars and cents accruing by the addition of an unexpended balance to a round sum. The act making the last appropriation provides that when the money has been expended the Board shall cease to exist, and that the testing machine built under the direction of the Board and for its use shall be turned over to the Secretrry of War. As you are aware, the machine was but recently completed. By directions given the Board at the time of its organization, this machine has been erected at the Watertown Arsenal, situed at Watertown, Mass. As soon as it is turned over to the Secretary of War it drops into possession of the United States Ordnance Department, subject to this further provision of the act referred to, that parties desiring to have tests made can do so by paying for the same. The money will be expended before the end of the present fiscal year, which closes June 30. At the end of this month, then, the machine will be turned over and the United States Testing Board will cease to exist. For seven years your committee has importuned Congress for the necessary appropriations with such measure of success as has been reported to you.

For four years the Board has labored under many difficulties to plan and carry forward the work confided to it. A plan of investigation, which has received the hearty approval of this Society and eminent engineers throughout the world has been arranged. Such investigations as could be ecomically and effectively carried on without the use of the long-delayed machine have been faithfully prosecuted by some of the sub-committees of the Board, and as a foretaste of the valuable results anticipated by us all from the labors of the United States Testing Board, reporsts have recently been made by these committees which will at once become standard authority on the subjects treated. Our Society, the Testing Board, and the country at large have compensation for the long delay in the completion of the testing machine in its unprecedented excellence now that it is done. The labors of the Board, but just begun, have yielded benefits worth many times the gross amounts of the money appropriated, and our government has for future use by far the best testing machine in the world.

From time to time during the last seven years your committee has performed the distateful duties which devolve upon the "third house" at Washington, not corruptly, but honestly and earnestly commending a worthy object to the attention and support of the Government. In the performance of this work its members have willingly spent large sums of money in necessary expenses, and much valuable time, glad of the opportunity to make this contribution to so important a branch of scientific inquiry. Many members of the Society and some of the manufacturers of iron and steel, besides numerous scientific societies and institutions of learning, have aided the committee with their valuable influence. To all these your committee desire to return sincere thanks. And we desire to ask that you will overlook or forgive the shortcomings which have occured in our efforts to perform the duties assigned.

Engineers throughout our country realize the urgent need of the knowledge which the tests proposed were designed to procure. The country at large realizes it and fully approves the appropriation of the public money for this beneficent purpose.

Appropriations have been obtained, the necessary machinery had been provided, the Board seemed well selected, the work was auspiciously begun, when a bolt shot from a sky that was already lowering when we held

our convention in New Orleans two years ago, struck the United States Testing Board, the pet child of our Society, *dead*.

If you cannot weep over its fall, picture to yourselves the tragedies which result from the ignorance which it was created to remove, and think of the symmetry, strength and perfection of the structures which American engineers would have given to the world, aided by the knowledge which this effort was designed to procure.

Who, we ask the "American Society of Civil Engineers," are the rightful owners of the testing machine and other appliances procured with the people's money for the use of the United States Testing Board? If the people, then let it be retained in the service of the people to promote the common interests of the country, and not be turned over to any single bureau or department of the Government specially skilled only in a particular line of inquiry.

The knowledge we so much desire and so sorely need can only be obtained by a mixed board of experts independent of the control of any particular governmental department, except so far as the honest expenditure of the money appropriated is concerned.

Now what will our Society, with its membership of six hundred, distributed in every State and Territory of the United States, do in this matter? Have we the necessary power and influence to induce the Government to right the grievious wrong that it has done us?

Your committee respectfully recommends that a new committee be appointed on tests, the chairman of which should reside at or near Washington, and a ten times more vigorous effort than any yet made by the Society should be put forth to recover what has been lost by inattention.

As engineers, and as a society, we owe it to the committee and board who have labored so long without pay, to procure the means and make the tests. We owe it to our country and to the world, since the work has been so auspiciously begun, to see that it shall not be permitted to fail until the knowledge we so much need, and which is now just within our grasp, has been secured and thoroughly digested and prepared for common use.

At 10:40 the doors were opened, and Mr. Charles Paine assumed the Chair. A Communication was received from the Otis Iron and Steel Company, thanking the engineers for their brief visit in the afternoon, and also inviting any who so desired to come again, and stated that conveyances would be provided. A vote of thanks was tendered.

On motion the Convention proceeded to ballot for a Nominating Committee, the two secretaries acting as tellers.

The election resulted in the choice of the following gentlemen:

Mr. Thomas E. Hardee, of New Orleans.
Gen. W. Sooy Smith, of Chicago.
Mr. Charles Paine, of Cleveland.
Mr. T. J. Whitman, of St. Louis.
Mr. J. P. Davis, of Boston.

Gen. Smith asked to be excused, and Mr. Thomas C. Keefer, of Ottawa, Canada, elected in his stead. This was agreed to.

The President was instructed to ascertain the best way for the members to obtain Government reports.

The Convention then, at midnight, adjourned to meet at nine o'clock Thursday morning.

## Great Reduction in Rates.

CIRCULARS ISSUED BY THE NEW YORK GAS LIGHT COMPANIES.

OFFICE OF THE MANHATTAN GASLIGHT COMPANY,
No. 4 IRVING PLACE, NEW YORK, June 27, 1879.

The Manhattan Gaslight Company respectfully informs its consumers and the public generally that on and after this date the price of gas furnished by this company will be at the reduced rate of 20 cents for 100 cubic feet to all who consume less than 10,000 cubic feet of gas per month. To those who consume 10,000 feet per month the price will be 19 cents per 100 cubic feet, or $1,90 cents per 1,000. To larger consumers a still greater reduction will be made, the price depending upon the quantity supplied. Having availed itself of all known improvements, this company will continue to furnish in the future, as it has done in the past, as pure, as safe, and as desirable a light as can be obtained by any process yet invented or discovered.

JAMES W. SMITH, *Secretary.* GENERAL ROOME, *President.*

OFFICE OF THE NEW YORK MUTUAL GASLIGHT CO.,
36 UNION SQUARE, NEW YORK, July 1st, 1879.

The New York Mutual Gas Light Company begs to inform their patrons and the public, that on and after this date the price of gas will be as follows: To consumers of less than 10,000 cubic feet, per month, 20 cents for 100 cubic feet, or $2 for 1,000 cubic feet. To consumers of 10,000 cubic feet, per month, 19 cents for 100 cubic feet, or $1.90 for 1,000 cubic feet. To large consumers a reasonable reduction from above prices will be made. Service pipe, meters, and burners will be supplied on application, without charge. This company has availed itself of all improvements in the manufacture of pure, safe and economical gas, and claim for it great superiority over any gas sold in the city. We solicit a continuance of your patronage, and that of all your friends, assuring you and them of prompt attention and courtesy.

CHARLES PLACE, *Secretary.*

The following burlesque "ad." appeared in the daily papers on the day after the Manhattan's announcement. Who paid for it?

TO CONSUMERS OF GAS—GREAT REDUCTION IN PRICES!!!

OFFICE OF THE MAGNIFICO RUSH LIGHT CO.,
RIP VAN WINKLE PLACE, NEW YORK, June 17, 1879.

This company respectfully informs its customers and the public generally that for the past 40 years it has endeavored to supply them with light, and by the arrogance and incivility of its officers to maintain a monopoly of the lighting business. A new company having recently started to supply a gas, said to be made from water (?), this company finds it necessary, in order to try to maintain its monopoly, to reduce the price of gas, and therefore to simplify its business and to make it easily understood by its customers, it has from this date adopted a scale of prices, 42 in number, so arranged that a consumer of 9,600 cubic feet of gas per month will be compelled to pay more than a consumer of 10,000 cubic feet, and so on, with a still greater reduction to larger consumers, on the principle that the poor man should always pay more than the rich man for the necessaries of life. The officers of this company having made themselves masters of the gas business some 25 years ago, feel confident that they have all the improvements that existed then, and also feel sure that no improvements of any kind have since been made in the science of making gas or in any other science, and they will always in the future, as in the past, furnish the best light that can be made by any of the processes which were in vogue 25 years ago.

PIFF-PAFF-POOM, *Secretary.* GENERAL BOUM, *President.*

OFFICE OF THE MUNICIPAL GASLIGHT COMPANY,
Nos. 358 & 360 FOURTH AVE., July 3d, 1879.

Bills rendered by this company after the 1st of July, 1879, will be made at the rate of $2 per 1,000 cubic feet per month. When 10,000 cubic feet has been consumed during the month, a discount of 5 per cent. will be made from that price, and a greater discount to consumers of larger quantities. The Municipal company's gas is from 20 to 30 per cent. cheaper to the consumer, at the same price, than the gas of the Manhattan company to say nothing of the 40 per cent. more light given by the Municipal gas, which is 22 candle power against the Manhattan's 16 candle. The Municipal company trusts that the public will will not lend its support to the Manhattan company in the futile effort now being made by them to crush out the opposition companies (which companies have brought about a reduction in the price of gas to this city and its inhabitants) for the purpose of regaining the monopoly so long held by them; and, therefore, appeals to all its customers and the public generally to support it and not to be tempted by the offers of the Manhattan company to sell gas at far less than it costs to furnish it, a proceeding which must lead all thinking men to the conclusion that its object is to attain some selfish end.

PHILIP ALLEN, *Secretary.* CHAS. G. FRANCKLYN, *President.*

OFFICE OF THE NEW YORK GASLIGHT CO.,
157 & 159 HESTER STREET, NEW YORK, July 1st, 1879.

The price of gas supplied by this company, on and after this date, will be as follows: For *less* than 10,000 cubic feet per month, the price will be $2 per thousand. For 10,000 feet per month a discount of five per cent., and for a larger quantity per month a further rebate will be made.

GEORGE W. DOANE, *Secretary.* THOMAS K. LEES, *President.*

INTERVIEWS BY HERALD REPORTERS.

In an interview had with a *Herald* reporter General Roome, the president of the Manhattan Gas Light Company, who began the present war of retrenchment, gives another view of the cause for the present movement. The public will probably care but little about the real or imaginary causes of the quarrel among the gas purveyors, so long as they get good light and cheap rates, or have the prospect of performing their household cooking with gas so cheap that prudent housekeepers will thereafter do without coal, cinders, ashes, and the bother and no inconsiderable item of servants' wages. Yesterday a *Herald* reporter paid a visit to all the gas light companies in the city, and the result of his tour, printed below, will be found of interest to every gas consumer.

GENERAL ROOME'S EXPLANATION.

General Charles Roome, president of the Manhattan Gas Light Company, was called upon at his residence in West Fifty-second street, where

the gentleman was confined by a slight illness. "In the absence of data, which are at the office, I will tell you all I can," said he, "about the reduction in the price of gas made by the Manhattan Company, and the causes which led to it."

"What is the extent of the reduction?"

"The extent of the reduction which went into effect on the 1st of July varies. To the largest consumers we sell gas at $1.25 per 1,000 cubic feet, and the prices vary intermediately according to the quantity of gas consumed. To be more exact, the price of gas to those who consume less than 10,000 cubic feet per month is $2 per 1,000 cubic feet; to those who use the latter amount and over per month it will be $1.90 per 1,000 feet, and still further concessions are made in the case of large consumers, until the minimum rate I have spoken of is reached."

"How many consumers has the Manhattan Company?"

"About 27,000."

"Has the introduction of the electric light had any influence upon your company in making these reductions?"

Mr. Roome replied contemptuously and quickly, "The electric light has had nothing whatever to do with the matter. I do not think the electric light worth a moment's consideration."

"What are the causes, may I ask, which have led to the reduction?"

"I will tell you what the policy of the Manhattan Gas Light Company has been, and then the subject will be better understood. I have always been in favor of selling gas at as small a profit as possible commensurate with a fair degree of profit to our stockholders. Since my connection with the company, which began in 1836, we have reduced the price of gas from $5 per 1,000 cubic feet to $2.50. Having no opposition when the war broke out, the increased cost of all materials and the enhanced value of labor compelled us to advance the price. There was also at that time the government tax of 25 cents on each 1,000 cubic feet of gas made. The increased rate at that time was from $2 to $3 per 1,000 feet. And now I will inform you of a fact which has never hitherto been made public. Mr. James Brooks, then a member of Congress from the Eighth district of this city, at my request urged upon Congress the propriety of the abolition of this tax. It was done upon giving him my personal pledge that the consumers of gas should have the benefit of the change. We at once reduced the price to $2.75. Afterward we reduced it twenty-five cents per 1,000 feet, making the cost $2.50, at which rate it remained up to the 1st of July."

"There have been complaints against your company in the past," the reporter remarked, suggestively."

WAR TO THE KNIFE.

"I will recite some of the facts of the past. Years ago the Manhattan Gaslight Company made a contract with the city by which we agreed to lay pipes wherever the authorities might direct. At that time the resolutions authorizing the use of gas by the Corporation were passed by the Common Council, the work under their provisions being carried out under the direction of the Superintendent of Lamps and Gas. Under that contract we were to light the street lamps for a price then agreed upon for a period of twenty years. The city required the company to lay pipes in streets where we could have no inducement to go, because the amount of private consumption would be very small. A large part of the money thus expended has never been remunerative to the company. We have laid pipes and lighted every street in our district, extending from Grand to Thirty-fourth street, and, before the Metropolitan Company went into operation, as high up as Central Park. Three more opposition companies have been chartered and obtained the consent of the city to lay pipes wherever they pleased on the Island. Two of these companies are under no restriction whatever as to the price of gas charged the consumer."

"Which are the companies you refer to?"

"I refer to the Mutual and Metropolitan companies. The Municipal Gaslight Company, the last one established, bound themselves not to charge over $2.40 per 1,000 cubic feet. The Metropolitan company bought all our pipes north of Thirty-fourth street. The Mutual and Municipal companies are competing with the Metropolitan, Manhattan and New York companies. Being free to lay their pipes where they pleased the Mutual and Municipal companies have selected only those streets where the largest consumers could be obtained, leaving the unremunerative portion of the districts to be supplied by the Manhattan. The consequence is that they could go to the large consumers and undersell us, therefore taking from us the profitable part of our business. In other words they select the tenderloin, leaving us to digest the tougher portion of food for sustenance. Necessity has therefore compelled us to fight them on their own terms. If they mean to make us supply the poor without profit we are determined they shall not be permitted to make money out of the rich. It is war to the knife. We do not fear either one of the competing companies. I am fully confident that the gas made by the Manhattan company is purer and safer than that manufactured by either of the others, and that its illuminating power is fully equal to either."

"Do you think the electric light will ultimately supplant the use of illuminating gas?"

"I do not. The electric light is costly and unsteady. The day may come, however, when it may be made available for purposes of display or lighting large open spaces. Up to this time we have no reason to expect that it can ever come into general use. In Paris, during the Exposition, it cost five times as much as gas, and was unsatisfactory. Paris paid largely for its use during the exhibition, because it made an attractive display. In London it has been lately tried to light the banks of the Thames, but on account of its great expense they have abandoned its use."

THE NEW YORK COMPANY'S REDUUCTION.

At the office of the New York Gaslight Company, in Hester street, the reporter found Mr. George W. Doane, the secretary. "Our company," said he "supplies the district below Grand street from river to river. The price now charged is $2 50 per 1,000 cubic feet. The subject of a reduction of the price of gas furnished to our consumers was agitated before the 1st of July, and would have been acted upon before the present time were it not that many of our Board of Directors are in the country and it has therefore been impossible to convene a board meeting."

"Will you reduce the price?"

"I have no doubt whatever of it. A meeting will be held to-morrow for the purpose of taking steps toward putting into effect a reduced scale."

"Has the Edison light induced the company to make a reduction?"

"Edison has had nothing whatever to do with it. Competition and dull times have influenced the change. The reduction to be made by this company will date from 1st of July."

"What will be the extent of the reduction?"

"I cannot at present state. When it is made gas will be cheaper than it has ever before been in this city."

THE MUTUAL FALLS IN LINE.

"The Mutual Company," said Mr. Charles Place, its secretary, as he leaned back in an easy chair at its offices in Union Square, "contemplated a reduction in the price of gas furnished its customers some time ago, but the Manhattan Company got the start of us. We have made a reduction, however, since the Manhattan Company announced its intention, and our directors will meet to-morrow to make still further reductions. In other words, we shall adopt a sliding scale to apply to large consumers. It is our purpose to sell gas as cheaply as any other company in the city."

"How many consumers does your company supply?"

"We have about 16,000 customers on our books."

"What are the influencing causes of the reduction?"

"The action of the companies in reducing the cost price of gas is influenced in consequence of the spirit of competition and the lessened cost of material and labor."

"Has the electric light had anything to do with it?"

"Not a particle."

"Is it possible for the Edison light to compete with the gas companies in furnishing illumination to small consumers, as it were?"

"It has been demonstrated that it cannot. That fact has been positively ascertained. We have in use now a sliding scale. We sell to those using less than 10,000 cubic feet a month at the rate of $2 for 1,000 feet; to those who use 10,000 cubic feet during the same period we sell at the rate of $1.90, and to larger consumers a liberal discount in prices will be made. The revised schedule to be prepared will apply more particularly to large consumers, such as institutions, hotels, theatres, and similar structures. The proposed reduction will make it an object of economy for people to use gas instead of coal for heating and cooking purposes. It will work a revolution in respect to household economy. By its use the nuisance of dust and cinders will be obviated, while the cost of help will be lesseued, and in a large house this latter will prove a very important item. With gas it is possible to cook a meal for a family without heating up the house, which is not the case where stove or ranges are used."

"WATER GAS" TO BE CHEAPER.

In the new building on the southwest corner of Twenty-sixth street and Fourth avenue, are the offices of the Municipal Gas Light Company, and there the *Herald* reporter found Mr. Phillip Allen, its secretary, who was quite willing to impart any information in his possession on the subject of the former's visit.

"This company," said Mr. Allen, "employs a process of manufacturing its gas invented by a Frenchman named Tessie du Motay. It is popularly called 'water gas.' We use coal to decompose the steam, and then it is carburetted with naphtha to produce gas."

"How many consumers do you supply?"

"We have at the present time between 6,000 and 7,000. The company was organized in 1874, but real work was not begun until 1876."

"Have you followed the example of the Manhattan Company in reducing the price?"

"We have," was the reply. "Here it is as it went into effect on the 1st of July," he added, at the same time handing the reporter a slip of paper on which the following schedule was printed: "Under 10,000 cubic feet, $2; 10,000 to 15,000, five per cent. discount; 15,000 to 25,000, ten per cent. discount; 25,000 to 35,000, fifteen per cent. discount; 35,000 to 45,000, twenty per cent. discount; over 45,000, twenty-five per cent. discount."

"What rate were you charging before the reduction?"

"We charged $2.40 per 1,000 cubic feet."

"Do you charge deposits on your meters?"

"No; we ask no deposit from any responsible party. There being no deposit required, gas at the reduced cost will be within reach of poor people who hitherto have probably thought themselves unable to afford the expense."

"What are the boundaries of your district?"

"Our works are at Forty-fourth street and the North river. The company's mains are laid from Seventieth to Grand street, chiefly from Eighth to Third avenue."

"What is the character of gas made by your process?"

"There it is," he replied, pointing to a clear, white light burning from a side bracket: "it is of twenty-two candle illuminating power. How this compares with the gas manufactured by the other companies is shown by the examinations made at the photometrical rooms of the Department of Public Works of the gas consumed by the city for the three weeks ending on the 28th of June last. The record shows that while the Municipal Company was making gas, as is proven by its books, of twenty-two candle illuminating power, the average power of the New York Company's gas was 16·89, that of the Manhattan 17·15, the Mutual's was 18·08, the Metropolitan's 18·29, and the Harlem's 16·50."

"Has the introduction of the electric light had any effect on the cost of illuminating gas?"

"No; the reduction is made chiefly, I suppose, because the Manhattan Company made it."

"How do you regard the utility of the electric light?"

"I think its use impracticable for private consumers. A practical demonstration of the new light, made in London, and which was made the basis of a report on the Parliamentary investigation of the subject by such eminent men as Professor Tyndall, Dr. Siemens, Dr. Hopkinson and Sir William Thompson, shows that it costs one and two-thirds per cent. more than the illuminating gas made there from what is termed 'semi-bituminous' coal. There is another matter of importance. A great deal of fault has been laid to gas that arises from the defective manner of burning it. Persons do not always use suitable burners. They should ascertain which are the best burners to throw a clear, white light. Whenever a burner is found to be defective it should be changed at once. The cost is but a few cents, and the cost of wasted gas is enormously more in a great many cases."

AT THE METROPOLITAN COMPANY'S OFFICES.

"The Metropolitan Gaslight Company," said Mr. O. F. Zollikoffer, its secretary, "supplies the district from Thirty-fourth to Seventy-ninth street, and from river to river—that is to say, its mains run all over the district stated, but it does not exclusively supply all the consumers within these boundary limits. We have not yet reduced the price of gas to our consumers, because many of our directors are out of the city. Had it not been for the latter fact I have no doubt the reduction would have been made several days ago."

"Will you now reduce your rates?" the reporter queried.

"I think there is not a particle of doubt that there will be a reduction. I am confident that it will be directed as soon as our directors can be summoned together at a special meeting."

"What are your present rates?"

"Since September, 1877, we have charged those using less than 30,000 cubic feet per month at the rate of $2 25 per 1,000 feet; those who used from 30,000 to 50,000 feet were charged $2, and those who burned from 50,000 feet upward at the rate of $1 75 per 1,000 feet."

"What has induced this virtuous freak on the part of the gas companies, which have hitherto been regarded as the closest of all the monopolies?"

"The introduction of the electric light has had nothing to do with it. That much is certain. It is purely a business move. The action of the companies is due to competition, and the reduced cost of all materials required in the manufacture of gas, and also to the somewhat reduced cost of labor."

"To what extent will you reduce your rates?"

"I cannot now say positively as to that, but I can safely say that the Metropolitan Company will not be behind the others, and that the reduction to be made will date from July 1st."

"Do you think it a judicious business principle to exact a deposit on meters from your consumers?"

"I think the system entirely correct and in no sense a hardship. I am also of the opinion that the reduced cost of gas will stop to a great extent the use of oil lamps, and lessen the number of fires which have heretofore been attributable to their use. Furthermore, it will open up an immense field of business in the disposal of gas for cooking and heating purposes. Now, the sales of gas are alone in the evening, and consequently the works remain idle eighteen or twenty hours a day. If the works could be used during the day to supply gas for other than domestic purposes it can be seen at a glance to what volume the business could be increased. You can see how much, with cheap gas, would be saved to the housekeeper, in the item of servants's wages alone, leaving coal out of the question, as well as the destruction to furniture, lace curtains, and the like from ashes and cinders."

THE REDUCTION GENERAL.

The Knickerbocker Gaslight Company has its works on the two blocks between Ninety-eighth and Ninety-ninth streets, from Second Avenue to the East River. The company is erected upon the remains of the old defunct Union Gaslight Company, a number of capitalists, among whom are Pierrepont Morgan, William B. Cutting, and M. Bayard Brown, having bought up the stock and organization of the latter.

Since August last the Knickerbocker Company has laid over seventy miles of piping along Third avenue and the intersecting streets, and has struck up a lively rivalry with the Harlem Company for the possession of the business of the upper end of the island. Thus it will be seen that what has hitherto been regarded as the closest of all metropolitan monopolies is at last broken, probably forever, and as a result every company in the city is now selling cheap gas.—*New York Herald*, July 10th.

## The Use of Chloride of Magnesia in Wet Gas Meters.*

By W. Göbel, Engineer Gas Works at Hanover, Germany.

The use of chloride of magnesia as a liquid for filling wet meters has of late been frequently suggested. Experiment, however, has shown that it is applicable only when the gas is absolutely free from ammonia. This has the property of decomposing a portion of the chloride of magnesia, thus forming free ammonia, which, with a further portion of the magnesic chloride, forms a double salt—magnesia being deposited in a solid state.

$$2\,MgCl_2 + 2\,NH_3 + H_2O = MgCl_2\,2\,NH_4Cl + MgO.$$

The precipitated magnesia constitutes a white mass, which settles in the bottom and corners of the meter, and particularly in the wheelwork, and finally completely clogs both the clockwork and the shell. Although the gas in Hanover contained but from .13 to .26 grains of ammonia per 100 cubic feet at the time of an experiment, yet a considerable accumulation of magnesia took place in a very few months. The metallic portions of the meter were not in any way corroded, and an analysis failed to detect any metallic compounds in the remaining liquid. While the meter was in use, therefore, no injurious action upon the alloy portions had taken place. On the other hand, upon opening the shell, and particularly the drum, and exposing it to the air but a short time, large spots of rust appeared on the surface, which at several places had so far penetrated that complete corrosion would have taken place in a very few weeks. This is explained by the fact that the double salt of magnesia and ammonia became decomposed under liberation of ammonia, yielding free hydrochloric acid, which now acted upon the metallic parts much more energetically than could the solution of chloride of magnesia alone:

$$MgCl_2\,2\,NH_4Cl = MgCl_2 + 2\,NH_3 + 2\,HCl.$$

I made a further investigation, in order to determine to what extent chloride of magnesia is suitable to completely purify the gas. Analyses showed me that gas which, on leaving the scrubbers, contained 31 grains of ammonia in 100 cubic feet, was completely freed from it by being passed through chloride of magnesia; and a gas containing 1.2 grains was also thoroughly purified. It was observed that the solution of chloride had no influence on the illuminating power of the gas.

A Novel System of electric lighting is announced from California, where the inventors reside. Only one lamp (with carbon points) is used to illuminate a large number of apartments. The lamp is placed near the generator of electricity and surrounded by lenses and reflectors, forming a chamber of light. These lenses are to concentrate light into as many beams of parallel rays as may be required, which beams are then carried through pipes in the street or house to the places to be illuminated. At the bends reflectors are arranged to change the direction of the beam, and where light is wanted for one apartment, and the beam still has duty to perform in an adjoining room, only a part of the beam is bent in the first apartment.—*Coal Trade Journal.*

* Translated from *Dingler's Journal*, No. 231, p. 240.

THE AMERICAN GAS LIGHT JOURNAL AND CHEMICAL REPERTORY

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WEDNESDAY, JULY 16, 1879.

## The Contest of the Gas Companies.

Those of us whom the present appears clearly as the mere bridge connecting the past with the future find greater cause for congratulation in the recent openly declared war which has broken out so suddenly and so vigorously between the gas companies, than in the welcome fact that gas bills are certain to be reduced. In the first place, the actual cost of gas is going to be made clear, so clear that the dullest will be able to understand it, while the contest is evidently going to be of such a vigorous character that the noise it will make must excite the attention of even the most apathetic.

The spectacle, too, of these great corporations contending for the continuance of their power to tax the community will be a most instructive sight. Already society is beginning to feel that its destiny is something grander than simply serving as an exploitation ground for corporations. We are no longer in the days when the tallow dip was an improvement upon the pine stick torch and the force of innovation was supposed to have reached its limit. A community like New York has been educated to the physical and moral uses of light, and recognizes that it is not only a symbol of progress but an actual efficient means to that end. It is the best promoter of order, security and peace there is. Put a gas light in a city's blind alleys and they cease to be the lurking places of vice and crime. They are no longer blind alleys.

Our very language recognizes the moral power of light, and an unlightened community, to be really such, must illustrate it in its physical appliances as much as in its social and industrial institutions. To such a community it is as undesirable to be undercharged for the service it requires as to be overcharged for it. It asks no one to injure himself for its benefit, and certainly will not injure itself for his benefit.

The perfect organism is made up of a combination of organs, each performing its functions, not to each other's injury but to their natural benefit. That the social body has not yet arrived at its perfection in this regard this very contest of the gas corporations shows, while those of us who can remember a few years back how harshly some of these companies disregarded the reasonable request of their workmen, are not surprised at seeing them to-day overtaken by the Nemesis that regulates such matters.—*N. Y. Daily Graphic*.

# Correspondence

[We are not responsible for the opinions expressed by Correspondents. Correspondents, in all cases, should sign their communications with their names and address in full—not for publiction, unless desired, but as a guarantee of good faith.—ED.]

### Sugg's Large Burners.

The American Meter Company has received the following from Sugg, which answers many anxious inquiries:

VINCENT WORKS, VINCENT STREET,
WESTMINSTER, June 27, 1879.

AMERICAN METER CO.—Gentlemen: I am in receipt of your two letters of the 16th inst., and much regret having been compelled to delay sending off your orders. As you will perceive from inclosed invoice, a large parcel of burners, etc., have been sent off. I have had such a tremendous run on 80-candle burners that I found it impossible to get more than four ready by the time the cases were ready for shipment, and did not wish to keep same here any longer, knowing how pressed you would be for the goods. I can well understand how unpleasant it must be for you to have been kept so long without the burners, and should have been only too pleased to have supplied you with five times the amount if it were possible. I have been very much engaged lately in professional work, which necessitated my absence from town and from England for nearly three weeks. I forward also lithographs of large burners and lanterns, of which the globe lamp is my latest design. I hope to advise you shortly of having despatched another parcel, completing your orders. I think it would be well if you would impress on your patrons that the new lighting system being, so to speak, in its infancy, it is perfectly impossible for me to pull off more work than I do at present without running the risk of turning out inaccurate and slovenly work, which would only result to damage my interests more than the delay in the delivery of orders. You may reckon on prompt delivery for the future. I am working my hands nearly day and night now, and hope to send on all the rest of your orders very shortly. I am, dear sirs, yours very truly,

WILLIAM SUGG.

### Charging Retorts.

*Mr. Editor*:—Now that the electric light agitation has somewhat subsided, it may not be amiss to discuss some of the means whereby the practical gas maker may be enabled to cheapen the manufacture of gas, as well as to increase the production of the same from a given amount of material.

By what system of charging retorts can the best results be obtained? is a question of importance to many of your readers, and one which, perhaps, every manager has settled to his own satisfaction, but which, as a matter of interest to all, may bear a little ventilation. The systems of charging in actual operation are, as is well known, charging with the shovel and charging with the scoop. Both systems have their advocates, but, Which is unquestionably the best? That is the question which might be very profitably discussed. In charging with the shovel, from the time the first shovelfull of coal is thrown into the retort until it is closed, gas is wasted; and no matter how experienced the workmen may be who handle the shovel, the coal can not be charged as nicely as when the scoop is used by men who know how to use it. Nearly two years ago your correspondent introduced the use of the scoop in a works where for over twenty years the retorts had been charged with the shovel. The men were very expert in the use of the shovel—none could be more so; yet the result is just this—that the same men, using the same kind of coal and the same benches of retorts, now carbonize 35 per cent. more coal per retort in 24 hours, and get over 18 per cent. more gas out of the coal. Of course there was violent opposition to the introduction of the scoop. "It was tried before, and could not be done." "Our retorts are not large enough." etc. In fact, all conceivable objections that could be made were made; and so it will be in the case of every superintendent who may try to introduce anything new to save labor in his works. But let all who have at least three men employed about the works try the scoop, and try it under their own supervision, with proper scoops, and in a way that they should be handled; and although their gain may not be as large as ours actually was, they will nevertheless gain enough to repay them for the trial.

Some years ago your correspondent was given charge of a large retort house, in which all the work men had gone on strike. Having been given authority, he engaged new men, nearly all of them having never seen the inside of a retort house. Within two days thereafter that company's district was well supplied with gas, although just before that time there was not enough gas on hand to light up the works. There were some 90 benches under fire One week after this time the regular number of benches only were needed. Had the system of shovel charging been used then, the men could not have learned quickly enough to do as described.

There is another system of charging retorts which deserves far more attention, especially by large gas companies, than it seems to receive. This is charging retorts by machinery. Your correspondent had the good fortune to come in daily contact for nearly a year with a machine usee for drawing and charging retorts. The machine was constructed by Mr. T. F. Rowland, of Green Point, N. Y., and was run at the works of the New York Gas Light Co. Although, in the opinion of your correspondent, this machide was too complicated as then constructed, it seemed to him that Mr. R. was on the right track to success in this matter. By removing a few of the unnecessary parts of this machine—the ones that always gave the most trouble—and by substituting a simpler device, which was known at the time, and also by letting practical gas men, not merely good machinists, run the same, it might now be all it was hoped it would be, and might spoil some of the calculations of the electric light people. The machine charged the coal into the retort evenly and quickly, and, supposing the present regenerator furnace were used in connection with this machine (as it can be built), the saving in labor to large gas companies would probably not fall short of 40 per cent. It may be to the interest of all the larger gas companies to try and induce Mr. Rowland to finish and bring out his machine. Meanwhile let those who are not too much prejudiced give the reasons why, in their opinion, shovel charging is to be preferred, and thereby oblige, undoubtedly, many of your readers. Yours truly,

Norfolk, Va. FREDERIC EGNER.

**Shelbyville (Ind.) Gas Light Company.**—On the 7th inst. the following gentlemen were elected officers of the above company: John Blessing, President; George H. Dunn, Vice-President; A. J. Gorgas, Treasurer; and G. W. Kirk, Secretary.

## Prices of Gas Coal.

| | | |
|---|---|---|
| Penn and Westmoreland | $4.50 | at New York. |
| " " | 3.50 | at Baltimore. |
| " " | 3.75 | at Philadelphia. |
| Despard, Newburgh Orrel, Murphy Run, Fairmont | 4.25 | at New York. |
| | 5.30 | at Baltimore. |
| Chesapeake & Ohio | 4.50 | at New York. |
| " " | | |
| Newcastle | 3.25 to 3.50 | |
| Provincial | 3.50 to 3.75 | |
| Cannelton Cannel (by cargo) | 8.75 | at New York. |
| Ince Hall | 7.25 | |

The above prices are about $1 per ton below those of 1878.

T. B. RITER, *President.* W. J. MILLER, *Sec. and Treas.* P. MUNZINGER, *Eng. and Supt*

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**Tin in Tasmania.**—Tasmania appears to be rapidly becoming a second Cornwall Four years ago the tin and tin ore exported from the colony amounted to only $7,000, but in 1877 it reached nearly $270,000. The tin ore contains some gold, which increases its value.

## Gas Stocks.

**Quotations by G. W. Close Jr., Broker and Dealer in Gas Stocks.**
**(with W B Scott & Co.,)**

24 PINE STREET, NEW YORK CITY.

JULY 16, 1879.

☞ All communciations will receive particular attention

☞ The following quotations are based on the par value of $100 per share. ☜

| | Capital. | Par. | Bid. | Asked. |
|---|---|---|---|---|
| *Gas Co.'s of N. Y. City.* | | | | |
| Central | 466,000 | 50 | 60 | 75 |
| Harlem | 1,800,000 | 50 | 40 | 45 |
| " Bonds | 170,000 | | | 103 |
| Manhattan | 4,000,000 | 50 | 130 | 140 |
| Metropolitan | 2,500,000 | 100 | 110 | 115 |
| " Scrip | $1,000,000 | .. | 100 | 103 |
| Mutual | 5,000,000 | 100 | 50 | 55 |
| " Bonds, gold | 900,000 | 1000 | 102 | 105 |
| Municipal | 1,500,000 | 100 | 115 | 120 |
| " Bonds | 750,000 | | 95 | 100 |
| New York | 4,000,000 | 100 | 90 | 95 |
| Nothern | 270,000 | 50 | — | 100 |
| *Gas Co's of Brooklyn.* | | | | |
| Brooklyn | 2,000,000 | 25 | — | 125 |
| Citizens | 1,200,000 | 20 | 50 | — |
| " S. F. Bonds. | 320,000 | 1000 | 100 | 102 |
| Peoples | 1,000,000 | 10 | 20 | 30 |
| " Bonds | 325,000 | ... | -- | 95 |
| " Scrip | 300,000 | ... | 75 | 80 |
| Metropolitan | 1,000,000 | 100 | 50 | 55 |
| Nassau | 1,000,000 | 25 | 55 | 65 |
| " Ctfs. | 700,000 | 1000 | 80 | 85 |
| Williamsburgh | 1,000,000 | 50 | 70 | 75 |
| " Scrip | | ... | 90 | 95 |
| Kings Co | 200,000 | 100 | — | 70 |
| Union Co. E. N. Y. | | 25 | — | 50 |
| Richmond Co., S. I. | 300,000 | ... | 60 | 85 |
| *Out of Town Gas Companies.* | | | | |
| Bath, Maine | 70,000 | 100 | | |
| Buffalo Mutual, N.Y | 750,000 | 100 | 65 | 70 |
| " Bonds | 200,000 | 1000 | 95 | 100 |
| Baltimore, Md | 2,000,000 | 100 | 95 | 98 |
| " Ctfs., gold | 1,000,000 | | 95 | 10 |
| Bayonne, N. J | | 100 | | 90 |
| Brockport, N. Y | 25,000 | 100 | ... | 80 |
| Citizens, Newark | 918,000 | 50 | 100 | 103 |
| " " Bds. | 124,000 | — | 105 | 10 |
| Chicago Gas Co., Ills | | | 128 | 130 |
| Cincinnati G. & C. Co. | | | | 190 |
| Derby of Conn | 160,000 | 100 | 60 | 80 |
| East Boston, Mass | | 25 | 114 | 120 |
| Elizabethtown, N. J. | 300,000 | 20 | — | 130 |
| Fort Wayne, Ind. | | 100 | ... | — |
| Hannibal, Mo | 100,000 | 100 | 95 | 100 |
| Hartford, Conn | 700,000 | 25 | 120 | 125 |
| Hempstead, L. I. | 25,000 | 100 | ... | — |
| Jersey City | 750,000 | 20 | 145 | 155 |
| Jamaica, L. I. | 25,000 | 100 | ... | — |
| Jacksonville, Ill. | 120,000 | 50 | 100 | ... |
| Lewistown Maine | 400,000 | 100 | 70 | 80 |
| Lima, Ohio, | 60,000 | 100 | — | ... |
| Bonds | 30,000 | | 90 | |
| Laclede St Louis Mo. | 1,200,000 | 100 | — | 75 |
| Long Branch | | 20 | 30 | 40 |
| New Haven, Conn | | 25 | 152 | — |
| Peoples, Jersey City | | ... | — | 80 |
| " " Bds. | | | | 95 |
| Peoples of Albany | 650,000 | 100 | — | 10 |
| " Bonds | 350,000 | 1000 | -- | -- |
| Peoples of Baltimore | | 25 | 44 | 48 |
| " Bonds | | | 106 | — |
| Plainfield, N. J | 80,000 | 100 | — | 105 |
| Perth Amboy | | 25 | — | 95 |
| Rochester, N. Y. | | 50 | 70 | 80 |
| " Citizens | | 100 | 50 | 60 |
| Toledo, Ohio | | | 95 | 97 |
| Washington, D. C. | 1,500,000 | 20 | — | 200 |
| " Scrip | 500,000 | 20 | 100 | — |
| Yonkers | | 50 | 70 | 80 |
| Woonsocket, R. I. | 150,000 | 100 | 80 | ... |
| Halifax N. S. | 400,000 | 40 | 148 | 150 |
| Hamilton, Ontario | 150,000 | 40 | 117½ | |
| Pittsfield, Mass | | | 120 | 130 |
| Rondout & Kingston | | | 75 | 80 |
| St. Louis Missouri | 600 000 | 50 | 72 | 75 |
| Stillwater, Minn | 50,000 | 50 | — | 26 |
| Saugerties, N. Y | 15,000 | 100 | 95 | 100 |
| Troy, Citizens | 600,000 | 100 | — | 60 |
| San Francisco Gas-Co., S. Fr'isco Cal. | | | 95 | 95¼ |

The following sales were made at auction since our last report: 345 shares Metropolitan, New York, at 126⅛, 126¼, 127, 111, 112, 113. $16,660 scrip of same company at 103¼–102½. 50 shares New York, at 97. 13 shares Manhattan, at 163½–167. $1,600 scrip of Nassau, Brooklyn, Co., at 85½.

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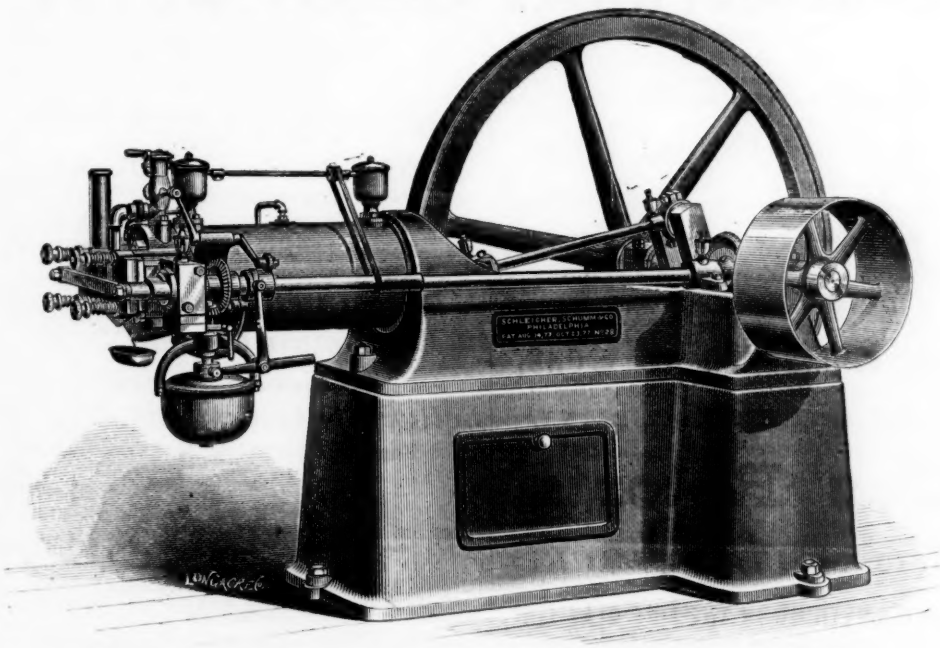

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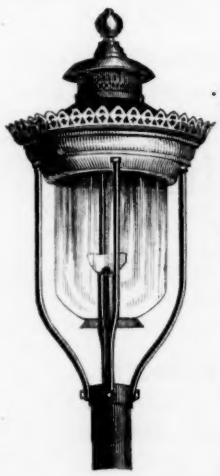

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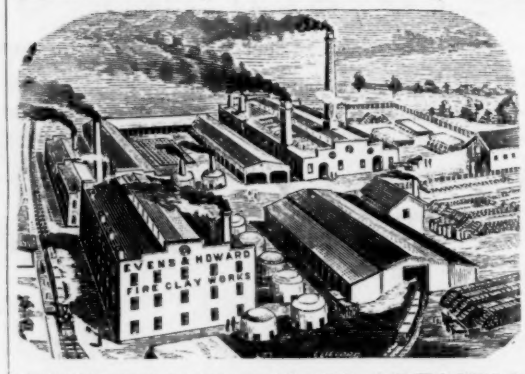


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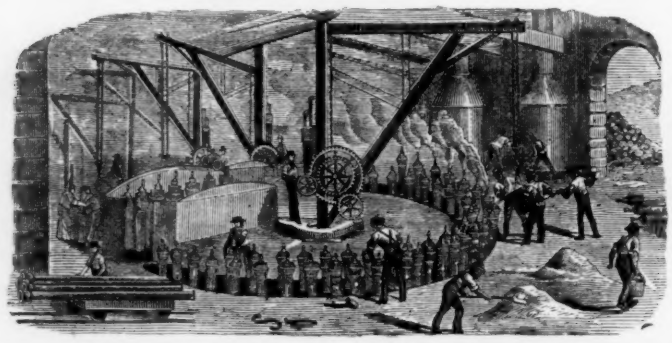

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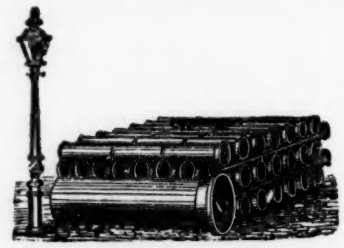

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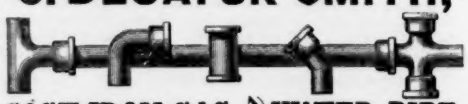

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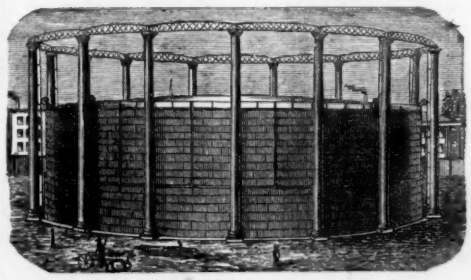

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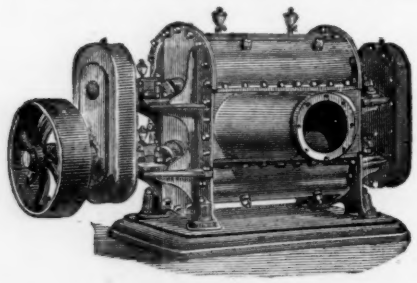

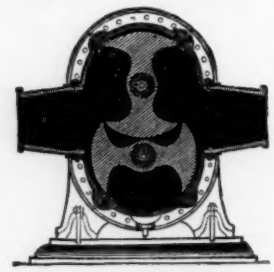

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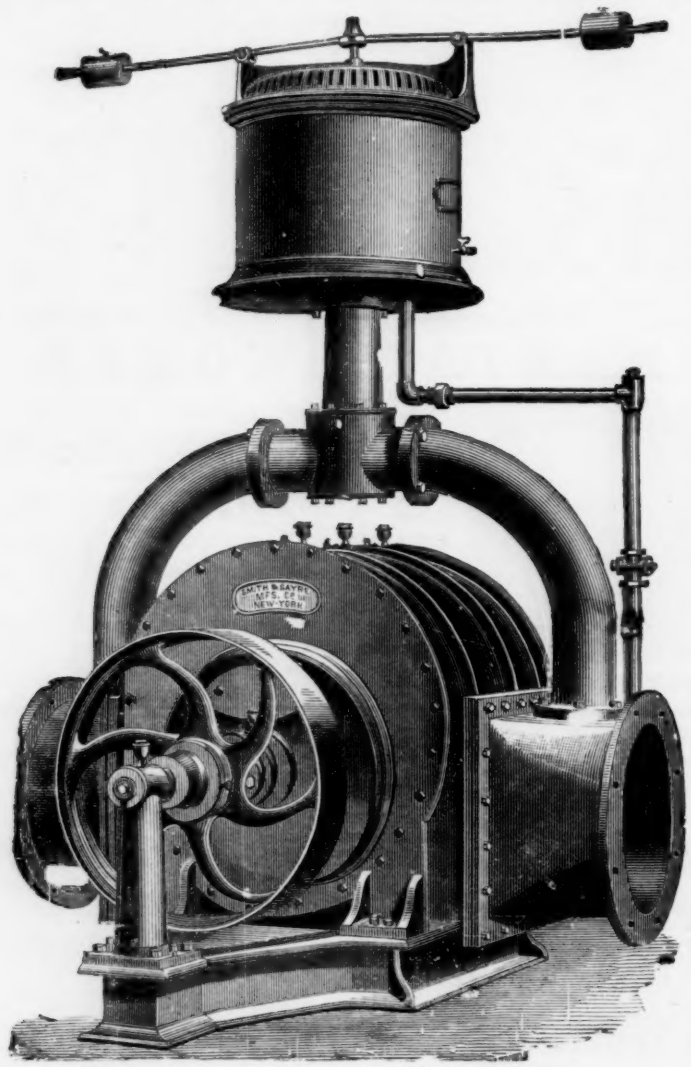


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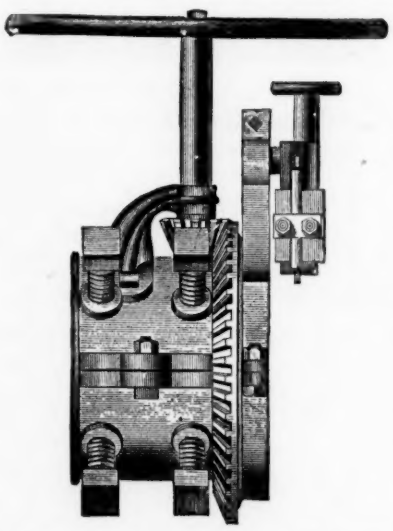

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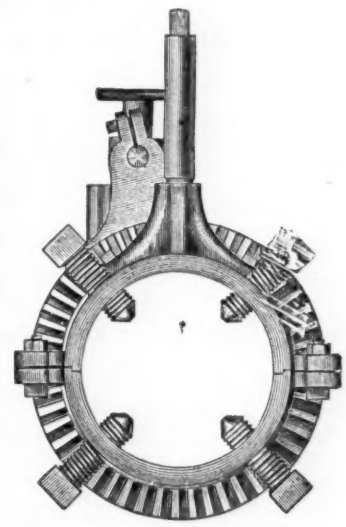

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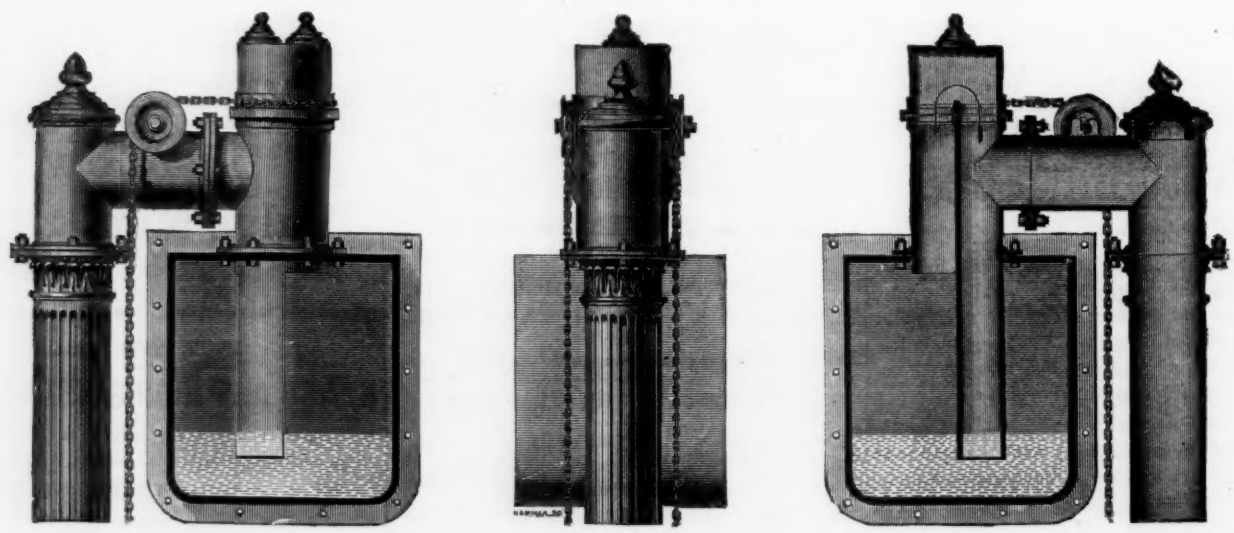

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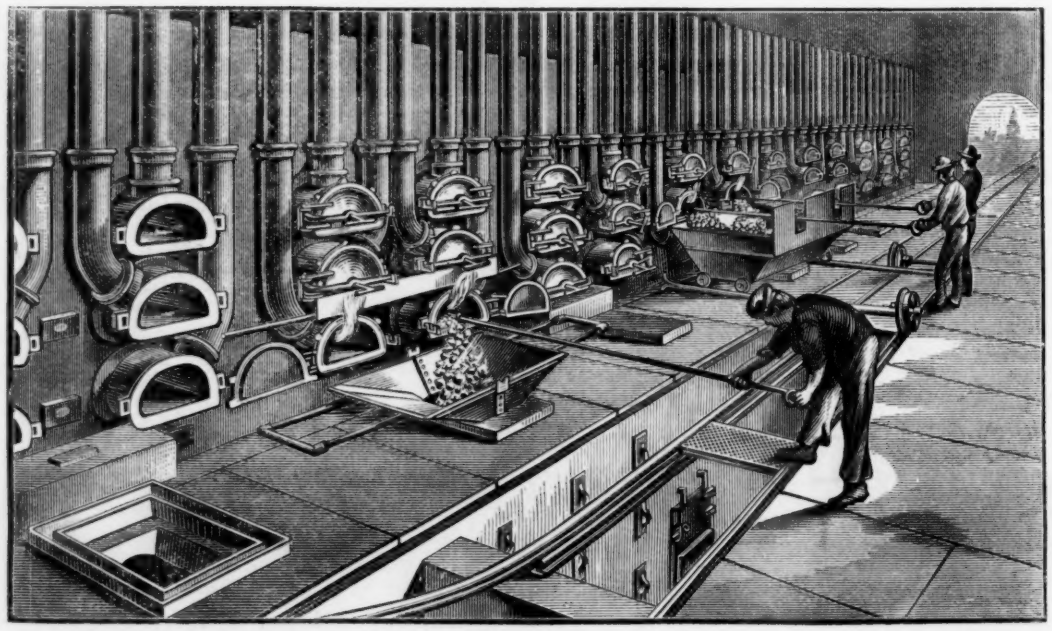

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